

# Science Discovers the Physiological Value of Continence

## – Part 1

By Dr. R. W. Bernard, A.B., M.A., Ph.D.

---

An opinion has gained ground in modern times, not only among the general public, but also among physicians, that the belief in the physiological value of continence belongs to the dark ages of religious superstitions and scientific ignorance, and is incompatible with physiological knowledge. Certain pseudosexologists, have exploited this idea to their commercial advantage and have created in the public mind a phobia in regards to continence, which is regarded as a cause of nervous and mental diseases and a positive health danger. On the basis of this belief, physicians and psychoanalysts have looked on continence for the cause of the nervous ailments of youth and have advised young men to visit prostitutes and risk venereal infection as a lesser evil than the assumed hazards of abstinence.

A careful reading should, however, convince any open-minded reader that the above view is false, and that continence per se can never do harm, but is always beneficial; and that when trouble occurs in an individual not practicing normal sex relations, the fault is not continence but some vicarious means of sex expression, excessive nocturnal emissions, etc. In view of the richness of the semen in lecithin, cholesterol, phosphorus and other constituents of nervous and brain tissue it is clear that it is incontinence, or loss of these valuable nerve-nourishing substances which, by promoting undernutrition, is responsible for disturbed functioning of the nervous system and brain, and never true continence, contrary to the unscientific views of the psychoanalysts.

We have seen that the internal secretions of the sex glands stand at the basis of the individual's physical and mental vitality and that sex hormones are present in the external as well as in the internal secretions of the gonads. Many of the effects attributed to such hormones, as we have seen, are due to the physiological effect of resorbed semen. Conservation of semen means conservation of sex hormones and increased vigor, while loss of semen means loss of hormones and diminished vitality; also chronic deficiency of such hormones leads to the symptoms of senility, which Voronoff and Steinach strove to overcome by increasing the amount of sex hormones in the blood.

The semen is a viscid albuminous fluid, alkaline in reaction, which is very rich in calcium and phosphorus, also in lecithin, cholesterol, albumen, nucleoproteins, iron, vitamin E, etc. In the ejaculation of the normal man, about 226 million spermatozoa are given off; these are rich in phosphorized fats (lecithin), cholesterol (the parent-source of sex hormones), nucleoproteins and iron. An ounce of semen is considered to be equal in

value to sixty ounces of blood, of which it constitutes an extract of some of its most valuable of constituents, as far as its vitalizing power is concerned. Dr. Frederick McCann remarks on this point, "From what has been stated it must be admitted that the spermatic fluid does possess potentialities justifying the belief of ancient writers concerning its vital properties.

The semen contains substances of high physiological value, especially in relation to the nutrition of the brain and nervous system. If resorption of semen through the wall of the female genital tract has a vitalizing effect on the female organism, the same should be the case in the body of the male in which it is formed and conserved. And conversely, loss of semen must deprive the organism of vitality and valuable substances necessary for the nutrition of nervous tissue, such as lecithin, which has been used therapeutically with great success for the cure of neurasthenia resulting from sexual excess.

The following are among the many physiological evidences which demonstrate the value of continence: 1. There is a remarkable similarity of chemical composition between the semen and the central nervous system, both being especially rich in lecithin, cholesterol and phosphorus compounds, which would indicate that seminal emissions withdraw from the body substances necessary for the nutrition of nervous tissues. 2. Excessive voluntary seminal losses (through masturbation, coitus, coitus interruptus, and contraceptive practices) are debilitating and harmful to the body and brain. 3. Excessive involuntary seminal losses (through nocturnal emissions, diurnal emissions, spermatorrhea, etc.) are debilitating to the nervous system and may cause neurasthenia. 4. Observations of the immediate effects of the sexual orgasm indicate that it temporarily exhausts the nervous system, and when repeated too frequently leads to chronic nerve-weakness (sexual neurasthenia). 5. Continence is beneficial to the brain (for conserved lecithin from retained semen is a true brain food.) Hence some of the greatest intellectual geniuses in ancient and modern times led continent lives. These include Pythagoras, Plato, Aristotle, Leonardo da Vinci, Spinoza, Newton, Kant, Beethoven, Herbert Spencer, etc. 6. Recent physiological evidence, pointing to the fact that the seminal fluid contains substances of great physiological value (such as Poehl's Spermine, which is a nerve-stimulant, lecithin, cholesterol, vitamin E, male sex hormones, etc.) supports the idea that continence is beneficial to health, as do the experiments of Prof. Brown-Sequard on the vitalizing effects of testicular extracts and those of Prof. Steinach on the rejuvenation that follows the enforced conservation of semen through ligature of the efferent testicular duct. 7. Leading physiologists, urologists, genito-urinary specialists, neurologists, psychiatrists, sexologists, gynecologists and endocrinologists endorse the physiological value of continence. Among such authorities are Moll, Kraepelin, Marshall, Lydston, Talmey and others.

Dr. Jacobson sent two hundred letters to professors of physiology, hygiene, venereal diseases, nervous diseases, neurology and psychiatry, inquiring as to their opinions concerning continence. All answers with few exceptions declared continence to be conducive to health. The following were among the answers received.

Kraepelin says that continence is not injurious, and that its advantages in avoiding venereal infection are apparent. Gaertner also does not think that continence is injurious to young men. Gramer writes, "Sexual continence before marriage is not injurious. Finkler answered that sexual continence is not injurious to young men, but, on the contrary, is beneficial to body and mind. Lassar also thinks that sexual continence is not injurious to young men. Seiferts says that his experience teaches him that continence is not injurious. Gruber says "There is no reason why continence should be injurious." Jurgensen thinks that sexual continence per se is not injurious. Strumpell thinks that continence is indirectly useful in preventing venereal infection, and is not injurious. Hoffman considers sexual continence useful. Strumpell thinks that continence is indirectly useful in preventing venereal infection, and is surely not injurious. Tuczak is of the opinion that continence is beneficial. Prof. von Leyden says that, in his experience, he has never seen injurious consequences from continence. Hein says that in most men sexual continence is not injurious. Prof. von Grutzner writes that in his opinion sexual continence is almost never injurious. Prof. Meschede, during 47 years of psychiatric practice, has never seen a case of insanity caused by sexual continence. Weber writes that that continence is not injurious to young men, but, on the contrary, is useful. Hoche is of the opinion that sexual continence is not injurious to young men and does not lead to masturbation. Neisser writes: "Most of our young men could remain continent much longer than in the case nowadays." Aschffenberg writes: "Even those who are predisposed to nervousness do not suffer any harm from sexual continence if the impression is awakened in them that abstinence can never be injurious." Moll says: "At the present time, most medical men agree that sexual abstinence, in a general way, is not harmful." Hutchinson says: "The belief that the exercise of the sex function is necessary to the health of the male at any age is a pure delusion while before full maturity it is highly injurious."

Among eminent authorities on sex who believe that sexual continence is without harm and beneficial to health are the following: Forel, Moll, Professor Montegazza, Professor Alfred Fournier, Prof. Dubois; professor of neuropathology at Berne; Prof. Furbringer, Loewenfeld, Krafft-Ebing, Prof. Lydston, Ruggles, Prof. Oesterling of Tübingen University, Chassaignac, Professor Beale of the Royal College of London, the eminent gynecologist, Ribbing, the great authority, Acton, the gynecologist, Hegar, the eminent English authority on the physiology of sex, Marshall, Dr. L. Robinowitch, neurologist and psychiatrist, formerly president of the New York Neurological Society, the eminent psychiatrist, Dr. Spitzka, also once president of the New York Neurological Society, the New York gynecologist and sexologist, Dr. B.S. Talmey, Professor Sajous, dean of American endocrinologists; Dr. Bruce of the University of Oklahoma, Professor Brown-Sequard, world-famous physiologist and father of the science of endocrinology, and others.

Professor von Gruber of Munich, an eminent European authority on sex, writing on "The Hygienic Significance of Marriage", says that it is absurd to regard the semen as an injurious secretion like the urine, which requires periodic evacuation, but as vital fluid which is not only reabsorbed during sexual abstinence, but this reabsorption appears to have a beneficial effect on the physiological economy, as shown by the large number of

intellectual geniuses who have led continent lives. Dr. Bernard S. Talmey, an eminent American gynecologist and authority on sex, expresses a similar opinion, and states that in the absence of sexually exciting stimuli, the semen and spermatozoa are produced in smaller amounts and are completely resorbed through the seminal vesicles, so that continence becomes easy and natural; the conservation of this vital fluid, he claims, is necessary for the attainment of the greatest vigor of body and brain, while its loss is harmful, and a man may live through a lifetime in a state of complete continence, without injury, but only with benefit, as proven in the case of such men as Leonardo da Vinci, Kant, Beethoven, Spencer, etc. Dr. Dubois, the neuropathologist, says that sexual indulgence, not continence, is the cause of neurasthenia, contrary to the erroneous conclusions of the Freudian school. Professor Alfred Fournier, a physiologist of note, ridicules the idea of "the dangers of continence for the young man", and that during his years of medical practice, he has never come across one such case. Professor Montegazza, on the other hand, praises the benefits of chastity, both upon the body and upon the brain. Dr. John Harvey Kellogg, points to the fact that many of the famous Greek athletes of antiquity (as Astylos, Dopompos and others mentioned by Plato) practiced total continence during their training, which contributed to their extraordinary vigor. Professor Furbringer, a prominent German authority on sex, writes: "Sexual continence is in the unanimous opinion of the medical profession not injurious to health as is generally believed." Writing on "Sexual Hygiene in Married Life", he states that when neurasthenia occurs in an unmarried person it is generally due to masturbation or some other form of lasciviousness. Krafft-Ebing, the great authority on sexual questions, considers the "diseases of abstinence" a myth. The gynecologist, Loewenfeld, considers it possible for a sexually normal individual to live in permanent continence without any ill-effects whatsoever. According to the noted sex physiologist and endocrinologist, Prof. F.G. Lydston of the University of Illinois, "Continence per se, probably never is harmful. The non-elimination of the seminal secretion from the testes often is productive of great bodily and mental vigor." In his opinion, "one may be perfectly healthy and physically vigorous while leading a life of absolute continence." Ruggles writes: "Sexual abstinence is compatible with perfect health and tends to increase vitality through resorption of the semen."

Forel, the eminent Swiss authority on sex, says: "Abstinence, or sexual continence, is by no means impractical for a normal young man of average constitution, assiduous in intellectual and physical work and abstaining from artificial excitants", adding, "The idea is current among young people that abstinence is something abnormal and impossible, and yet the many who observe it prove that chastity can be practiced without prejudice to health". Dr. Perier points out the falsity of the notion of the imaginary dangers of sexual continence, and considers it a "physical, moral and mental safeguard to young men". Rohleder considers as unscrupulous the advice of physicians who recommend sexual intercourse to young men. Chassaignac claims that the healthier the individual, the easier to practice complete abstinence; it is only the diseased and neurotic person who finds it difficult to do so. Professor Oesterling of Tubingen says, "one cannot repeat too often that abstinence and the most absolute purity are perfectly compatible with the laws of physiology and morality, and that sexual indulgence is not more justified by physiology and psychology than by morality and religion. Professor Beale of the Royal College of

London says that "sexual abstinence has never yet hurt any man when it has been observed." The gynecologist, Ribbing, says that he has known many young men who have lived in total continence without difficulty or injury. Clarke says that continence increases health and energy, while incontinence does the reverse. According to Surbled, "the evils of incontinence are well known and undisputed; those produced by continence are imaginary." The great authority, Acton, says that the popular idea that abstinence causes the genital organs to atrophy and produces impotence is a grave error. "Chastity no more injures the body than the soul," he says. The gynecologist Hegar, considers the "sexual necessity" myth an illusion, while Ribbing, another eminent gynecologist, points out the needs for sexual control and continence. The noted physiologist, Marshall, in his "Introduction to Sex Physiology", points out the need for such restraint over the reproductive function and the sublimation of sex energy into higher cerebral forms of expression, as was the case with many intellectual geniuses of the past, who led continent lives. Dr. L. Robinowitch, a prominent American neurologist, says that "sexual continence is not only harmless but beneficial".

"American Medicine", in its editorial of July 1, 1905, remarks, "It should be an easy matter to convince any developed man that continence can be a normal state of civilized man." In 1906, the American Medical Association passed a resolution that "continence is not incompatible with health". The International Brussels Congress also declared that a chaste life for a man is not prejudicial to health, but, on the contrary, can be recommended from a purely hygienic standpoint. The congress stated, "It is the consensus of most of the great medical thinkers that it is not prejudicial to the health of a man to keep his body clean". The medical faculty of Christiania University issued the following statement: "The assertion that a chaste life will be prejudicial to health rests, according to our unanimous experience, on no foundation. We have no knowledge of any harm resulting from a pure and moral life".

Convincing evidence of the benefits of continence and that the assumed "sexual necessity" is an illusion is afforded by the study of the debilitating effects of sexual orgasm, which are immediate and striking. Though these have been attributed to purely nervous origin, there can be no doubt that they are chiefly due to the harmful effects of the seminal discharge, which involves a sudden withdrawal from the body of calcium, lecithin and other substances necessary for the normal functioning of the nervous system. Havelock Ellis, in his "Studies in the Psychology of Sex", quotes the observations of Dr. F. B. Robinson on this subject, as recorded in the New York State Medical Journal. He notes that when a stallion cohabits with a mare for the first time, after a short, vigorous coition, he is apt to fall down in a dead faint, which Robinson traces to brain anemia thus produced. He mentions one case of a mare falling dead immediately after. Young bulls frequently faint away after the first connection with a cow, and it is very common to observe a young bull so exhausted that he sneaks off to a quiet corner and lies down for a couple of hours. Fainting, however, does not occur in dogs, for the dog's connection is prolonged and thus shock is avoided; also the dog has no seminal vesicles. In the case of the boar, the orgasm rises to such a pitch that the animal seems on the verge of pain, and is usually exhausted for several hours.

Havelock Ellis writes:

"When we have realized how profound is the organic convulsion involved in [the] process of detumescence, and how great the motor excitement involved, we can understand how it is that very serious effects may follow coitus. Even in animals this is sometimes the case. Young bulls and stallions have fallen into a faint after first congress; boars may be seriously affected in a similar way; mares have been known even to fall dead. In the human species, and especially men, probably, as Bryan Robinson remarks, because women are protected by the greater slowness with which detumescence occurs in them - not only death itself, but innumerable disorders and accident have been known to follow immediately after coitus, these results being mainly due to the vascular and muscular excitement involved in the process of detumescence. Fainting, vomiting, urination, defecation have been noted as occurring in young men after the first coitus. Epilepsy has been not frequently recorded. Lesions of various organs, even rupture of the spleen, have sometimes taken place. In men of mature age, the arteries have at times been unable to resist the high blood-pressure and cerebral hemorrhage with paralysis has occurred. In elderly men the excitement of intercourse with strange woman has sometimes caused death, and various cases are known of eminent persons who have thus died in the arms of young wives or prostitutes."

The celebrated Russian general, Skobeloff, died while cohabiting with a girl of ill-fame. Robinson refers to the case of a judge who died shortly after connection with a girl in a brothel, and to the case of a man of seventy who died after intercourse with a prostitute. He also mentions the case of a man of 48 years of age who was found dying in a Chicago hotel after cohabiting with an accommodating widow. Also the case of a young man who fainted away at the first coitus, and that of a man sixty years old who had connection with a strange woman and fell dead as he walked to the door immediately after the act. Such deaths usually occur in elder men, and usually as the result of intercourse with strange women, which is more violent and intensive than with their wives. Atilla king of the Huns, died while cohabiting with his young wife.

Acton, the great medical authority, points out that in some persons the termination of the orgasm is accompanied by an epileptiform convulsion of more or less severity. This is succeeded by a great amount of prostration. This is seen in a very exaggerated form in the buck rabbit, which, after each copulation, may be noticed to fall on his side in a sort of epileptic fit, the whites of the eyes being turned up. The animal then gives several spasmodic twitches with its hind legs, and lies panting for several moments until the nervous system recovers itself. Acton mentions cases of deaths occurring in houses of prostitution as well as in the marriage bed as arising from the adverse influence of the sexual orgasm on the nervous system and on the body as a whole, especially in susceptible individuals. Entomological works abound with cases in which death follows copulation. Geddes and Thomson, in their book, "The Evolution of Sex", refer to the fact that some spiders normally die after fertilizing the female, and such sacrifice of the male occurs also in other species. The association of reproduction and death is well known in the case of flying insects, as the common mayflies. Emergence into winged liberty, the love-dance and the process of fertilization, the deposition of eggs and the death of the

parents, are often the crowded events of a few hours. "In higher animals", say these authors, "the fatality of the reproductive sacrifice has been greatly lessened, yet death may tragically persist, even in human life, as the direct nemesis of love..... The temporarily exhausting effect of even moderate sexual indulgence is well known, as well as the increased liability to all forms of disease while the individual energies are thus lowered..... Reproduction is the beginning of death."

Some years ago the author received the following interesting letter from a reader of this writings: July 29, 1936 Dear Dr. Siegmeister: I was wondering if the draining, at any time, of the lecithin and phosphorus, and other valuable substances during any sexual act, hindered achievement of the higher intellectuality, and if the brain and body were debilitated? Please answer this very important question. I am having great difficulty to understand how a person as myself, can store up vast amounts of sex forces without expending it. To make a long story short, I do not understand the very function of the sexual apparatus. Please send me any literature that you have on hand, concerning this matter, and I will greatly appreciate it. Also refer me to some excellent books which will cover this subject in full. I beg of you. Do not neglect answering any question asked in this letter. Thank you, .....

To this letter he made the following reply: Dear Mr. L\_\_\_\_\_: "You ask whether the draining from the body of lecithin and phosphorus through the sexual act will hinder the highest intellectual achievement and debilitate body and brain. Most definitely this is the case. Read my article on "Do Neuroses and Psychoses have a Chemical Origin?" in the June, 1936 issue of The Modern Psychologist, in which I show that the loss of these nerve-and-brain foods through sexual indulgence in any form deprives the nerves and brain of needed nourishment and leads to nervous and mental disorders. Our insane asylums are now overfilled with the victims of thoughtless sexual indulgence which has withdrawn valuable nutrients from the brain and disordered its functioning. These pitiful individuals, when in possession of their normal brain-structure, never realized that with each discharge of seminal fluid, they are pouring forth the very substance of their nerves and brain, until a time is reached when their brain is so sapped of lecithin that it ceases to function. Measurements have shown an actual decrease in the lecithin content of the brains of the insane. This was due to previous sex indulgence, as a result of which the sex glands took up the blood's lecithin to replace expended fluids.

"The greatest intellectual geniuses in both ancient and modern times led continent lives, and there is yet to be recorded one individual who freely expended seminal fluid who ever amounted to anything. In most cases, individuals who have achieved have been forced by necessity to abstain from sexual indulgence, as Cervantes, who wrote Don Quixote while in prison, or Dante who wrote his Divine Comedy while in exile. Milton wrote "Paradise Lost" when blind and when he did not indulge in sex. Sir Isaac Newton, active in intellect until the age of 80, led a continent life from birth, and so did Leonardo da Vinci and Michelangelo, both of whom retained their creative genius [until] an advanced age.

"You also ask how a person like yourself could store up vast amounts of sex force without expending it. To do so is easily accomplished if you try the right methods. In my booklet, 'Diet and Sex' I show how it is possible through a low-protein vegetarian diet to control the sexual impulses and how debilitating nocturnal emissions may be made to cease forever, since involuntary sexual losses are as debilitating as voluntary ones, for the same lecithin and cholesterin are lost. The morning after a nocturnal emission you will notice that the nerves are weakened and the body cannot stand the cold as well.

"You say: 'I do not understand the very function of the sexual apparatus.' It has two functions: Internal Secretion, which is primary, and Reproduction, which is secondary. Any other use of these endocrine organs is a perversion which will reap its penalty in the form of nervous disorder and premature old age and death.

"You ask me for good literature on the sex question. Permit me to introduce to you some of the most daring and original writers in this field, Melville Keith, M.D. The following is quoted from his work, "The Marriage Law:"

"We tell you that at every emission of semen you are losing the food and the best portion of the (blood) corpuscles, inasmuch as every particle of semen which is ejected will be replaced by more taken from the blood. This is enough to convince you that when you are ejecting the semen which should stay in the body and become reabsorbed so as to go and form the oil for the joints, new muscles, the brain material, as well as every other part of the body, you are really destroying or throwing away your life.

"You eject the substance of the synovial fluid. You send forth, to gratify a moment's passion, the very material of which the brain is made. This is a fact which you will acknowledge when you consider that all this semen is the material of which all these substances are made and supplied, and when the semen is ejected you have selected the best part of the body to go out and become to you a useless inert mass, which can never be restored to you under any circumstances. It is lost and gone. Then, the semen being out of the body, the sexual penalty comes apace. The penalty for this loss of semen is so far reaching and so concealed from the body of people of the present day that we do not know the exact spot to look for it. But we tell you, when you see paralysis, palsy, apoplexy, rheumatism, brain softening, bent shoulders and haggard face; when you observe a young old man and the dried up young lady, in all of these cases, and in dozens of others, you may set it down that there have been sexual losses and a waste of the bodily substance from the sexual orgasm.

"You will see this penalty all around you, and there is no place where you may go but you will see the fruits of this sexual indulgence to excess. The penalty may be denied, and all these diseases may be attributed to every other cause under the sun, but you will be right in laying it at the proper place, and that is to the sexual drain which has sapped the blood corpuscles of the victim before you. We assure you nothing can be so very enervating as this sexual excess, and any sexual mating is an excess, providing it is not for the purpose of having children.

``The penalty for the disobedience of this law is in the shortened lives and the increased amount of disease which are everywhere around us." The resemblance of the sexual orgasm to the epileptic attack has been noted by many authors. The sudden withdrawal of calcium produced by the seminal discharge biochemically produces the tetany-like symptoms of the orgasm, which are so similar to those of the epileptic attack which usually follows it in those who are constitutionally predisposed. According to Acton, the sexual orgasm resembles the epileptic attack both in its phenomena and its effects. The mental hebetude and physical prostration following the discharge of nerve force characteristic of an epileptic attack also follow the sexual orgasm. The latter profoundly affects the whole nervous system with such intensity that Acton says that "it is only mature individuals who can bear even infrequent acts of copulation without more or less injury. In young persons all the vital powers should be conserved for growth and development."

Dr. Deslandes observed that epileptic attacks often follow coitus, as was the case with Napoleon. He says: "There are some individuals who are susceptible to epilepsy that they have a regular attack of it whenever they indulge in sexual intercourse... That individuals subject to epilepsy are likely to have an attack when under the influence of sexual excitement is well known. It is related of the first Napoleon--who, as is well known, was subject to epilepsy--that he experienced a paroxysm every time he attempted copulation."

Menard had a watch-dog which was affected with epilepsy every time he copulated. These attacks were characterized by convulsions and by loss of consciousness. "Coition", said Democritus, "is a kind of epilepsy." "It is", said Haller, "an action very similar to a convulsion, and which of itself astonishingly weakens and affects the whole nervous system." Tissot reports cases in which emissions of semen were accompanied by "a convulsion, a species of epilepsy; and the same observation furnishes evident proof of influence which these violent actions have on the health of the unfortunate individual in whom they occur. The promptitude with which the weakness follows the act (of coitus)... and the debility of all those affected with convulsive diseases prove that the weakness is produced by the orgasm." Tissot illustrates this point by referring to an Amman of a Swiss village, mentioned by Platerus, who, being remarried when old, and anxious to consummate his nuptials, was affected with a suffocation so violent, that he was obligated to desist. The same thing recurred every time he repeated the act. He consulted a number of quacks; one assured him that after he procured and took several medicines he was no more in danger. He hazarded a new attempt on this advice; and full of confidence, he persevered, only to die in the act in the arms of his wife. Says Tissot: "The violent palpitations which sometimes accompany coition are also a convulsive symptom." Hippocrates speaks of a young man in whom excesses in wine and sexual commerce produced, among other symptoms, constant palpitations; and Daleaus saw one seized in the act with a palpitation so violent that he would have suffocated if he persisted.

Havelock Ellis remarks that the symptoms of coitus bear a strong resemblance to those of epilepsy, and refers to the statement of this effect by the sophist of Abdera, who said that coitus is a slight fit of epilepsy, "judging it to be an incurable disease." Caelius Aurelianus, one of the leading physicians of antiquity, said that "coitus is a brief

epilepsy." Fere has pointed out that both these forms of nervous disturbance have similar symptoms. Ellis notes that the epileptic convulsion in some cases involves the sexual mechanism, and that it is noteworthy that epilepsy tends to appear at puberty. Boerhaave has called coitus "a true epilepsy," and later Roubaud, Hammond and Kowalevsky have emphasized the resemblance between coitus and epilepsy. Some authorities have considered coitus as the cause of epilepsy, the sudden withdrawal of calcium from the system through the seminal discharge precipitating the tetany-like symptoms of the epileptic convulsion. Fere has recorded as case of a youth in whom the adoption of the practice of masturbation, several times a day, was followed by epileptic attacks, which ceased when masturbation was discontinued. West describes masturbation in an infant by thigh-rubbing which produced a convulsion that was mistaken by relatives for an epileptic fit. Tissot writes: "We know that paroxysms of epilepsy, when accompanied by an emission of seminal fluid, leave the patient more exhausted, and more confused, than in ordinary cases. Coition is an exciting cause of these fits in those who are subject to them; and Van Swieten attributes the real exhaustion of the patients to this cause if the attacks be frequent."

Dides knew a merchant in Montpelier who never had coitus without having soon after a fit of epilepsy. Van Swieten knew an epileptic person who was attacked with a fit of epilepsy the night he married. Hoffman mentions a very sensual woman who generally had a fit of epilepsy after each coitus. Boerhaave, in his "Treatise on the Diseases of the Nerves," claims that during the sexual orgasm all the nerves are affected, and sometimes so much as to prove fatal. He relates the case of a woman who fell into a very long syncope after every act of coition, and that of a man who died in the first act he engaged in, the force of the convulsion which rendered his whole body stiff, and for twelve years he suffered from this cataleptic condition, with complete loss of sensation and consciousness.

Mercier, an English psychiatrist, in his "Sanity and Insanity," writes that after the act of coitus, the resulting languor and lassitude indicate that a great strain has been placed on the store of energy available to the organism, whose seat is the nervous system, the highest regions of which--the brain--are most powerfully affected, and this tends to produce disorder of this organ. But while, with a normally constituted organism, the stress of the sexual orgasm is not sufficient to produce brain disorder, unless it is repeated with undue frequency, in one whose energies are naturally defective and which is constitutionally below the normal level of stability, the effect of the act will be to produce disturbed cerebral functioning. This is especially true when such indulgence is begun at too early an age. "Hence we find that a certain number of cases of insanity," says Mercier, "are attributed to sexual excess," adding, "The indulgence in this proclivity is a fruitful source of that deterioration of the higher powers of the nervous system which is the foundation of insanity."

According to this eminent English psychiatrist, the sexual orgasm has by its very nature a disintegrative, deteriorating influence on the organism; and the loss of energy it entails, especially when frequently repeated, results in apathy, lethargy and dementia. The tension of energy in the nervous system is thereby reduced to the lowest ebb, and, as a

result, the manifestations of this energy are either wanting or are exhibited in a feeble and prefunctory manner. "The condition is one of dementia... there is want of mind, the inability to perform mental operations of even moderate difficulty, the dullness and slowness of feeling, the loss of all the higher emotions and of many of the lower ones also, that characterize dementia." There occurs "a general degradation of conduct, the loss of all the higher attributes of humanity, and the retention of all the lower and more animal characteristics. Such are the results of the indulgence of the sexual passion in great excess. When the indulgence is less excessive, the degradation is less profound, but in every case there is degradation, and in every case the deterioration is of the nature of dementia, that is to say, it is a manifestation of a deficiency in the amount of stored energy."

Besides those cases in which the dementia produced by sexual excess is sufficiently pronounced to incapacitate the wretched individual for the duties of life, and to render it necessary to commit him to asylum care, Mercier mentions that there are an enormous number of individuals, forming a considerable part of the total population, in which premature decadence of mental powers, premature exhaustion of energy and premature senility result from excess sexual indulgence in early life. The young man, full of energy, launches out into sexual excesses which at the time appear to be indulged in with impunity, but sooner or later the day of reckoning comes, and then, says Mercier, "he is in the position of a spendthrift who is living on his capital;" having lavished his sexual capital in his youth, it is exhausted prematurely, so that before middle age he finds himself a sexual beggar.

Professor Lydston mentions cases of apoplexy, paralysis and fatal cardiac conditions occurring in predisposed persons as the result of sexual excess. "From a priori considerations," he writes, "involving the immediate effects of sexual excitement and indulgence upon the brain and spinal cord, we might naturally expect insanity to be a frequent result of masturbation and excessive venery." While the majority of persons are protected against such serious affects upon the cerebrospinal functions by their natural resistance, in those in whom this resistance nervous equilibrium incidental to faulty or imperfect nerve structure, whether due to heredity, congenital defect or acquired disease, the conditions are different. Under such circumstances, repeated sexual orgasms, according to Prof. Lydston, can procure "actual structural alterations of nerve-fibers and cells and vessels of the brain, with coincident psychopathic phenomena," which "are naturally to be expected as occasional results of these severe and repeated shocks to the susceptible nervous system produced by the sexual orgasms."

"Coition," says Noquez, "is a convulsion; it disposes the nerves to spasmodic actions, which are excited by the slightest cause." "It is", says Haller, "an action very violent, similar to a convulsion, and which of itself astonishingly weakens and affects the brain and nerves." Dr. Ryan writes: "Coition has been compared to a fit of epilepsy, to an electric shock; it entirely engages both mind and body; we neither hear nor see; and some persons have lost their lives in this crisis. It is for this reason that sexual intercourse has proven mortal after severe wounds, hemorrhages, etc., and when too often repeated, weakens the whole economy.

Rouband describes as follows the immediate effects of the sexual orgasm of coitus, which he compares to an epileptic attack:

"The circulation quickens, the arteries beat strongly, the venous blood, arrested by muscular contraction, increases the general heat, and this stagnation, more pronounced in the brain by the contraction of the muscles of the neck and the throwing of the head backward, causes a momentary cerebral congestion, during which intelligence is lost and the faculties abolished. The eyes, violently injected, become haggard, and the look uncertain. Or in the majority of cases the eyes are closed spasmodically to avoid the contact of the light. The respiration is hurried, sometimes interrupted, and may be suspended by the spasmodic contraction of the larynx, and the air, for a time compressed, is at last emitted in broken and meaningly words. The congested nervous centers only communicate confused sensations and volitions; mobility and sensation show extreme disorder; the limbs are seized by convulsions and sometimes by cramps, or are thrown wildly about or become stiff like iron bars. The jaws, tightly pressed, grind the teeth, and in some persons the delirium is carried so far that they bite to bleeding the shoulders their companions have imprudently abandoned to them. This frantic state of epilepsy lasts but a short time, but it suffices to exhaust the forces of the organism, especially in man. It is, I believe, Galen who said, 'Omne animal post coitum triste.' (All animals are sad after coitus.)"

Deslandes, who writes:

"During this tumult and after the crisis, the general state of the patient conforms in every manner to that of the genital system. Thus the face reddens, the neck swells, the veins become filled, the skin now burning and now moistened with sweat, the heart beats with rapidity. In fact, there is a state of fever which almost justifies us in placing the act of venery among diseases. At the same time the nervous centers, the cerebrum, the cerebellum and the spinal cord experience a very powerful impression. As the state progresses, consciousness is lost, and the subject is, at it were, in a state of delirium. The will is suspended, and the muscles are not controlled by it, but by the nerve centers which are so much irritated. The trunk and limbs are agitated by involuntary motions and chills. The disturbance increases until the crisis arrives, when the convulsions affect the genital system; a fit of epilepsy as it were ensues; the sight becomes dim; the trunk stiffens and neck is thrown back; and finally this state might be regarded as a violent access of disease if the beginning and end of it were not known.

"The genital apparatus, lately so full of life, now becomes flaccid; the scrotum becomes loose and pendulent, and a sensation of torpor, of fatigue, of chill follow. The convulsive motions are succeeded by a kind of paralysis, and all attempts at new excitement are in vain... Now, however, the individual is changed; his face lost its color, his limbs are stiff, and without motion as if paralyzed; the head is painful, the mind is slow and limbs are incapable of the least effort. The hearing is dull; the sight is deranged, and the external senses import to the brain only imperfect impressions. The pulsations of the heart are feeble, the pulse is small, the veins are collapsed and the eyelids are livid. The soul is left in a state of languor and sadness and becomes as it were melancholy."

During the sexual orgasm of coitus symptoms occur which border on psychopathology; and there can be little doubt that excessive frequency of such symptoms may indelibly impress themselves on the brain and nervous system. On this point, Deslandes observes: "The diseases affecting the nervous system, that system which is powerfully disturbed by coition, are not the only ones resulting from venereal excess. We shall see that all alterations of tissue, every physical disorder, may be caused by this. We may fearlessly assert that most of the inconveniences and diseases afflicting the human species arise from venereal excesses."

The great philosopher, Herbert Spender, himself a lifelong celibate, describes as follows the effects of sexual excess:

"Chronic derangements of health supervene, diminished bodily activity, decline of mental power, and sometimes even insanity... Specialists, who have good means of judging, agree in the opinion that the aggregate evils arising from excesses of this kind are greater than from those arising from excesses of all kinds put together."

Referring to a case of a man whose three wives all become insane after marriage, referred to in the "Journal of Mental Science", Jan., 1879, Havelock Ellis writes: "In cases of sexual excess, great physical exhaustion, with suspicions and delusions, is often observed. Hutchinson has recorded three cases of temporary blindness, all in men, the result of sexual excess after marriage (Archives of Surgery, Jan., 1893). The old medical authors attributed many evil results to excess in coitus. Thus Schurig brings together cases of insanity, syncope, epilepsy, loss of memory, blindness, baldness, unilateral perspiration and death attributed to this cause; of death many cases are given, some in women."

According to Prof. Lydston, the results of sexual excess are similar to those of masturbation, and both result from the disturbance of blood chemistry and general metabolism caused by the withdrawal from the body of the substances of which the semen is composed: calcium, phosphorus, lecithin, cholesterol, albumen, iron, etc. Though physical impairment, as well as mental impairment, from sexual excess is very common, less attention, has been paid to it than to the evil results of masturbation, in view of the current belief that, unlike masturbation, coitus is harmless under all circumstances. However it is Lydston's opinion that "sexual excess is the most prolific cause of that most civilized and most fashionable of all hydra-headed diseases, neurasthenia, adding, "Moderation in sexual intercourse is not only conducive to prolonged virility, but to longevity. It is certain that many cases of neurasthenia in both male and female are due to sexual excess."

According to Dr. Black, "Medical writers agree that one of the most common causes of the many forms of derangement to which a woman is subject consists in excessive cohabitation. The diseases known as menorrhagia, leucorrhea, amenorrhea, abortions, prolapsus, chronic inflammations and ulcerations of the womb, and a yet greater variety of sympathetic nervous disorders are some of the distressing forms of these derangements."

After referring to cases of men who died during coitus, Deslandes adds, "Many old men have yielded up their existence in the nuptial bed, when their term of life might have been continued if they had not exhausted their strength in unnatural exertions." Senac attributes to temporary exhaustion of the nervous system the feebleness which follows coition. The increased amount of blood in the brain at this time has several times produced apoplexy. Several such instances have been reported. Hoffman reports the case of a soldier addicted to sexual excess, who finally died in the act, the cerebrum having been found full of blood. "This increase of blood in the brain," says Tissot, "explains why these excesses produce mania. As this quantity of blood oppresses the nerves, it weakens; they are more susceptible of impressions and hence their debility." Tissot describes as follows the effects of sexual excess:

"The debility caused by these excesses derange the functions of all organs... Digestion, perspiration and evacuation do not take place in their usual healthy manner; hence the strength... (illegible portion)... even the understanding are evi... (illegible portion)... diminished; the sight is obscured;... (illegible portion)... of the nerves and all kinds of... (illegible portion)... and rheumatic pains, and astonishing weakness in the back, debility of the genital organs, bloody urine, deranged appetite, headache and numerous other diseases ensue; in a word, nothing shortens life so much as the abuse of sexual pleasures... Excesses in the gratification of sexual desire not only cause the diseases of languor, but sometimes acute diseases; and they always produce irregularities in those affections which depend on other causes, and very readily render them malignant when the energies of nature are at fault."

"Serruier mentions a case of a man who was reduced to a complete state of marasmus in consequence of sexual excesses and nocturnal emissions. Payva, a Portuguese physician, also observed marasmus to result from sexual excess. Sururier, like Boerhaave, mentions epilepsy, in addition to loss of sight and imbecility in a young soldier, the latter resulting from onanism and nocturnal pollutions. Parise mentions the case of a man who was desirous of living with a young Italian girl whose temperament was extremely ardent. "He paid for his imprudence by blindness, which occurred in 8 days, and which was followed by death."

Cases of individuals dying during coitus occur usually in persons very weak as the result of old age or disease. Fabricius mentions the case of a man who had sex relations on the tenth day after an attack of pleuritis, which had terminated on the seventh with perspiration. He "was seized by an ardent fever, and considerable tremor, and died on the thirteenth day." Chesneau knew two young married persons who were attacked in the first week of marriage" with a violent fever and considerable redness and swelling of the face; one of them had a severe pain in the sacrum; they both died in a few days." Tissot writes: "Hippocrates has left us in his history of epidemic diseases the case of a young man who after excesses with women and wine was attacked with a fever accompanied with symptoms the most violent and irregular, which finally proved fatal."

Hoffman relates a case of a man convalescing from pleurisy who after indulging in coitus had a relapse more dangerous than the original illness. Fabricius relates another case of a

young man whose leg was amputated, and whose physician forbade having any intercourse with his wife, who was also informed of the danger. The young man disobeyed orders and became gravely ill.

Dr. Talmey states that the frequent exercise of the act of copulation leads directly to anemia, malnutrition, asthenia of the muscles and nerves, and to mental exhaustion. Persons addicted to sexual excess may be recognized by their pale, long, flabby faces, which often have tense features. They are melancholic and usually not fit for any difficult or long continued physical or mental work. They have little power of resistance. The ill health of many women after a certain period of married life has the same cause.

Professor von Gruber, while doubting the allegation that sexual abstinence may prove harmful to the nervous system, is convinced that sexual excess certainly is. He believes that frequent discharges of semen lead to a "reduction of the peculiar internal secretion of the testes," which is otherwise resorbed into the blood-stream. The immediate effects of sexual excess, he states, are depression, fatigue and exhaustion. As further symptoms there is pressure in the lumbar region, nervous irritability, a feeling of pressure in the head, stupidity, insomnia, ringing in the ears, spots before the eyes, shunning of light, a feeble trembling and actual shaking, pounding of the heart, tendency to sweating and muscular weakness. There is also weakness of memory, neurasthenia, melancholic depression and disinclination to physical or mental effort. The digestive activity becomes less efficient and food is less well utilized. There is a deficiency in blood and a lowered resistance to infectious bacteria, the tubercle bacillus in particular, for which reason sexual excess is known to predispose to consumption aside from its tendency to drain the body of calcium. There is irritable weakness of the genitals, premature ejaculation, frequent nocturnal emissions, and increasing impotence. The more frequent nocturnal emissions that result increase the nervous irritability and exhaustion (i.e., neurasthenia). All these effects are more marked in the young and the aged; in the former, sexual excess, by its detrimental influence on metabolism and the process of growth, stunts physical and mental development, while in the aged it hastens death, often by causing heart failure.

By producing enervation and by exciting the nervous system, Dr. Shelton claims that sexual excess can further the development of any disease to which the individual is subject. For this reason a person predisposed to epilepsy is almost certain to have an attack after each sexual act. Some cases of epilepsy do not develop until after marriage for this reason. Asthmatic attacks and St. Vitus's dance are often brought on and perpetuated by sexual excess. Spinal and heart disorders are apt to occur. There is an increase of blood-pressure, which predisposes to apoplexy. Dr. Shelton writes:

"No function is so exhausting to the whole system as this. If excessively indulged in, no practice can possibly be so enervating. J. Bradford Sax probably over estimates the amount of energy consumed in coition when he says, "Probably more of the nervous fluid or influence is expended in a single sexual crisis than would suffice to carry on all the vital operations, perhaps for a day. At any rate the energy expended is very considerable and if the act is indulged in daily, or even weekly, the indulgent individual need not hope for health and strength.

"What constitutes excess? The reply has been given: Anything is excess when procreation is not the end. Man is sexually perverted. He is the only animal that has his 'social problem,' the only animal that supports prostitution, the only animal that practices self-abuse, the only animal that is demoralized by all forms of sexual perversions, the only animal whose male will attack the females, the only animal where the desire of the female is not the law, the only one that does not exercise his sexual powers in harmony with their primitive constitution."

"Who can say," interrogates Dr. Dixon, "that these excesses are not often followed by direful diseases, insanity and consumption? The records of our madhouses, and the melancholy deaths by consumption, of the newly married, bear ample witness to the truth of this assertion. Are they not transmitted to posterity? Look at the frequent mental imbecility, and the pallid hue, and attenuated form of the children who are the earlier products of marriage, and see the parents vibrating between life and the grave, until the candid physician, or the terrors of death teach them to abstain."

Of all members of the mammalian family, civilized man alone is a victim of an exaggerated and morbid sexual urge, a condition which he has inflicted, to a certain extent, on the animals which he has domesticated and which have adopted his diet, especially the dog. Wild animals in a state of nature practice copulation only at certain mating seasons for the purpose of reproduction. Civilized man practices this act at all times, and in most cases without intention to conceive. On the other hand, so-called savages and primitive races leading more natural lives and who follow their natural instincts to a greater extent are far chaste in their sexual behavior, as noted by Havelock Ellis. Such considerations must lead one to the conclusion that the sex life of civilized men is unnatural and that the excessive manifestation of the sex urge among them is due to certain aphrodisiacal stimuli rather than to natural instinct; among such stimuli are a high-protein meat diet (accompanied by physical inactivity), the use of tobacco, alcohol and coffee, sexually stimulating literature, dramas, motion pictures, conversation, etc. For these reasons civilized man has departed from the natural law, obeyed by animal and primitive races, which requires the separation of the sexes during pregnancy and lactation, for the benefit of both mother and child. Violation of this law may account for the large number of physically and mentally defective offspring produced by civilized races as compared with animals and primitive peoples.

Among the Andamanese, Portman says that sex desire is moderate in males, it does not appear before the age of eighteen, and is rarely gratified until marriage when a man is 26. According to Haydes and Deniker, among the Fuegians, both men and women are extremely moderate in sexual indulgence. In the case of the Esquimaux, Cook notes that the sexual passions do not manifest during the long darkness of winter, and the menstrual function does not either; the majority of the children are born nine months after the appearance of the sun. On the basis of such observation Havelock Ellis concludes that the sex instinct of primitive peoples is less intense and manifests more infrequently than that of civilized man; moreover it tends to manifest at certain mating seasons and to find expression chiefly in reproduction.

Animals, like men, become perverted sexually and victims of an exaggerated sexual urge when they are subjected to artificial feeding and confinement. Thus apes, when confined to a cage and fed on meat and other sexually stimulating food, while previously gentle and tame on a fruit diet, become extremely licentious and vicious. Then they masturbate excessively and have intercourse daily, while the female consequently menstruates as freely as a woman. (Other female mammals leading more natural lives do not menstruate, though under domestication and excessive feeding, cows and other species do.)

Holder finds that the Indians of America were originally far less salacious than either the white or the negro races that later came to this continent. Dr. Beard notes that Indian boys do not masturbate and young men remain chaste until marriage, conditions which we do not find among so-called civilized races. Spencer, who studied California Indians, remarks that after the appearance of menstruation, a girl is never allowed in the company of the opposite sex until her marriage, and that during pregnancy and lactation there is strict chastity. Nor is coitus permitted after feasts of meat, when there is a state of sexual super-excitation. Ordinarily the men and boys sleep in a separate dormitory. Spencer remarks that an intelligent Indian of his acquaintance on his death-bed confessed a sin that had grievously burdened his conscience. "He had cohabited with his wife after a big dinner of fresh beef, and felt the remorse of unpardonable guilt upon his soul."

Chastity before marriage is the rule in many parts of Africa. In some parts of West Africa a girl guilty of unchastity is severely punished. Among the Ba Henda of North Transvaal, no sexual intercourse before marriage is allowed, and if it is seen that a girl's labia are apart when she sits down on a stone she is punished as guilty of having had intercourse. Among the Syntengs, the husband does not live in the same house with his wife, but only visits her occasionally in her mother's house where she continues to live. Smyth remarks that promiscuous intercourse between the sexes is not practiced by the Australian aborigines, and their laws on the subject are strict. No conversation is permitted between single men and girls or married women. Infractions of these laws are sometimes punished by death. Among the Seri, the young man is compelled to pass a probationary period of continence for one year prior to marriage as a test of his ability of sexual self-control. Among the Pueblos, the morals of the young are supervised by a secret police which reports all irregularities, in which case the young man and girl are compelled to marry. In Uganda, continence is practiced for two years after childbirth, and among the Fijians, husband and wife live apart three or four years, so that no other babe may interfere with the time thought necessary for nursing children. Concerning the people of the Malay Peninsula, Stevens writes: "The sexual impulse among the Belendas is developed to a slight extent; they are not sexual... There is little or no love-play in sexual relations." Among the Malays, strict chastity is maintained during war time. According to Havelock Ellis, the negro races of Africa are less lascivious than white men. He writes: "Among the Cambodians, strict chastity seems to prevail, and if we cross the Himalayas to the north we find ourselves among wild peoples to whom sexual license was unknown. Thus, among the Turcomans, even a few days after the marriage has been celebrated, the couple are separated for an entire year."

Westmarck states that the more that civilization advances the greater the number of illegitimate births and the greater the prevalence of prostitution. These are greater in towns than in the country. He claims that promiscuity is not the original and natural state of man, but is a product of civilization, or rather pseudo-civilization. The customs of primitive races are comparatively chaste. Westermarck writes:

"Among a great number of simple peoples, monogamy requires of a man continence for periods of considerable length. He has to abstain from his wife not only for a certain time each month, but during pregnancy or at least during the later stage of it, since pregnant woman is regarded as unclean, and after childbirth until the child is weaned; and the latter injunction is the more severe as the suckling time lasts for two or three and occasionally even five or six years."

The ancient Spartans represent a race in which a high level of sex morality existed, and who were noted for their chastity. The sexes lived apart, even after marriage, the men sleeping together in one dormitory and the women in another. After the act of conception, which followed marriage, Plutarch, in his life of Lycurgus, states that the man "modestly retired to his companions, and reposing with them at night, nor even visiting his bride but with great caution and apprehension of being discovered by the rest of the family. Some of them even had children before they had an interview with their wives in the day time. This kind of commerce not only exercised their temperance and chastity, but kept their bodies fruitful, and the first ardor of their love free and unabated; for they were not satiated like those that are always with their wives."

To achieve the chastity which he considered essential for the preservation of the vigor of the Spartan race, Lycurgus, the law-giver of Sparta, forbade the consumption of meats and other stimulating foods, and enforced a vegetarian diet. Alcoholics were also prohibited. He forbade eating at home, and had the Spartans eat at collective public tables; and by thus controlling their diet, he was able to control their morality. He forbade his people "to call in the assistance of butchers and cooks, or to fatten like voracious animals in private. For so not only their manners would be corrupted but their bodies disordered, and abandoned to all manner of sensuality and dissoluteness; and they would require long hours of sleep."

In Sparta, a matriarchate in which women had great power, the boys were brought up to be chaste. Xenophon tells us that it is easier to make a pillar of stone or a marble statue move its eyes than a Spartan boy. The boys, he said, were more bashful than the girls. A woman of another country said to a Spartan woman, "You of Lacedeemon are the only women in the world that rue the men." She answered, "We are the only women that bring forth men." The bravery and physical perfection of the Spartan race made them famous throughout the ages.

## **A BIOCHEMICAL THEORY OF NEUROSES AND PSYCHOSES**

It is the purpose of this chapter to present the basis for a new biochemical understanding of the origin and treatment of neuroses and psychoses, based on new knowledge of the

chemical effects of the secretions of the sex glands, both internal and external, upon the central nervous system.

The eminent physiologist, Prof. Eugen Steinach has performed experiments which definitely showed that the internal secretions of the sex glands, after being resorbed into the circulation, pass principally to the brain and spinal cord, wherein they are stored. Steinach's experiments consisted in injecting into a series of castrated frogs extracts of the brain and spinal cord of frogs in heat, and into a second series of castrates extracts of the brain and spinal cord of similar castrates were injected. In the first series a good clasp reflex appeared, while in the second series no changes were visible. Steinach also found that injections of other organs of frogs in heat were unable to evoke the clasp reflex in the castrate. He therefore concluded that the primary action of the internal secretion of the sex glands, after passing into the blood, is upon the central nervous system, through the medium of which, probably by producing local changes in blood supply, effects are produced in various parts of the body.

The physiologist, Nussbaum, conducted similar experiments, on the basis of which he concluded that "the internal secretion of the testicle acts in a specific manner only on certain nervous centers from which impulses are sent to certain organs, and the metabolism of the latter is changed in a given direction." He observed that at the approach of the breeding season in the male frog, there appeared a thickened pad of skin on the first digit of each fore-limb associated with an increased muscular development of the forearm. This modification is used in the act of copulation. If the male frog is castrated, the pad is not formed and the muscle fails to develop. Nussbaum then noted that if pieces of testis from another frog are grafted into the dorsal lymph sac of a frog previously castrated, the secondary sexual characters of the latter developed just as in a normal frog. He also found that if the nerves supplying the first digit were severed, the pad did not develop, and if the nerves supplying the clasping muscles of the fore-arm were severed, the enlargement did not occur. He concluded that the internal secretion of the testis had a specific action on certain local groups of ganglion cells, and that the influence of the testis on the metabolism of different tissues is intermediated through the nervous system.

In the light of these and other physiological experiments, the fact is well established that the action of the secretions produced by the sex glands and resorbed into the blood-stream is primarily on the brain and spinal cord. The eminent authority, Professor Thorek, in his work, "The Human Testis," writes as follows on this subject: "The gonad elaborates through its internal secretions the chemical products which are taken up by the circulation and carried to the central nervous system, and there erotization results. That these substances of internal secretion have a selective action seems probable, and that such substances are stored in the central nervous system, seems, in view of recent experiments, quite certain... O'Malley thinks that the direct action of the chemical products of the gonads through the nervous system influences the growth and increased metabolism of every tissue of the body. That there is a direct relationship between the gonads and the hypophysis is fairly well established... Since the time of Hippocrates and Aristotle, it has

been believed that there was a coordination between the testicular fluid and the nervous system, brain and cord."

There exists considerable evidence from the field of psychiatry to indicate a definite relationship between the sex glands and the brain, and that the degeneration of the latter organ is usually accompanied by a degeneration of the former. Sir Frederick Mott found that the testicles in 27 cases of dementia praecox show atrophy of the seminiferous tubules and absence of spermatogenesis. The similarity between the state of the testicles and that of the brain suggests that this disease might result from a premature atrophy of the gonads, commencing at puberty or early adolescence and becoming more marked until it culminates in impotency accompanied by cerebral involution. In this connection it should be noted that the majority of these insane subjects studied by Mott were habitual masturbators, which practice should have a relation to their testicular degeneration, which Mott considers the primary cause of their brain involution and degeneration. Mott's observations were confirmed by Obregia, Parhon and Urechia(?) who also found degeneration of the seminiferous tubules and absence of spermatogenesis in dementia praecox. These investigators conclude that spermatozoa may have an internal function that is necessary for the normal metabolism of the brain, and that dementia praecox may be due to an alteration or deficiency of their production due to degeneration of the seminiferous tubules of auto-intoxication.

That the latter may result from masturbation and sexual excess in causing a chemical withdrawal from the circulation of lecithin, cholesterol and phosphorus compounds necessary for the nutrition of the brain (all of which substances are especially abundant in the semen), is indicated by the studies of the eminent American neurologist and psychiatrist, Dr. E.C. Spitzka, a celebrated brain anatomist who was formerly president of the New York Neurological Society. In his psychiatric textbook, "Insanity, Its Classification, Diagnosis and Treatment," Dr. Spitzka writes:

"That a connection between the development of the mind and the male genitals exists is indisputable. Even if we assume that the defective development of the genital system found in brain monstrosities, idiots, imbeciles, original monomaniacs and the periodically insane is an accidental accompaniment of the neural maldevelopment, we must admit the convincing proof that the early extirpation of the testicles, as in eunuchs and castrated animals, exerts an influence on the mental complexion and development.

"The functional abuse of the male sexual apparatus is of more general importance to the alienist than its organic affections. Excessive venery and masturbation have from time immemorial been supposed to exert a deleterious influence on the nervous system, and may provoke insanity, partly through their weakening effect on the general nutrition. That there is a close connection between pathological nervous states and the sexual function is exemplified in the satyriasis of mania and in the early stages of paretic dementia, as well as in the sexual delusions of manomania, and abnormal genital sensations of that condition. In the former case the sexual exaltation is a result, in the latter the genital sensations are collateral phenomena of the psychosis, but there are certain cases in which,

while an original predisposition may have existed, masturbation is the factor responsible for the production of insanity."

In his "Masturbatic Insanity," Dr. Spitzka presents a study of twelve cases of insanity, all of which he attributes to masturbation. He claims that the occurrence of psychoses as the result of masturbation is primarily due to arrested brain nutrition. This results from the withdrawal from the circulation of brain-nourishing lecithin and other phosphorus compounds through excessive seminal discharges. For we must remember that lecithin is a chief constituent of the myelin sheaths of nerve-cells and essential for their activity, during which it is consumed--for it is the nerve-oil that keeps the fire of nerve and brain activity burning. Since lecithin is also a principal constituent of the semen, we can readily understand why excessive sexual activity should lead to lecithin deficiency and undernutrition of nerve and brain cells.

While a generation and diminished size of the testicles have been found to accompany the involution of the brain in dementia praecox and other psychoses, and excessive development of the testes had been found to be associated with mental precocity. Professors Morro of Turin and Snoch of Genoa came across a child of nine who had three testicles and whose intelligence was far above that which is considered normal at its age. The parents, alarmed by the unusual characteristics of the child, had the extra testicle removed. Some months later the child's intellectual development underwent a regression, which brought it down to the mental level corresponding to its age.

In this connection, it is interesting to note that in contrast with the lasciviousness of idiots and the insane, which, according to Dr. Spitzka, is largely responsible for their arrested brain nutrition and development, most of the greatest mental geniuses in history led strictly continent lives (which should result in superior brain nutrition from the conservation of lecithin and other brain-nourishing seminal constituents). Thus among philosophers we have Pythagoras, Plato, Aristotle, Porphyry, Proclus, Leibniz, Berkeley, Locke, Spinoza, Kant and Spencer; among artists, Leonardo da Vinci, Michael Angelo, Raphael and Fra Angelico; among composers, Handel and Beethoven; and among scientists Newton. We have just seen how profoundly the sex glands influence the brain. Their influence on the nerves, however, is more immediate and profound. Deficiency of lecithin, present in the myelin sheaths of the nerves and necessary for their nourishment and the generation of their vitality, as the result of external discharge through the semen (which is very rich in this substance), provides a biochemical explanation of the etiology of neurasthenia, and indicates the proper method of therapy for this common malady. This fact has been suspected by Dr. Beard, originator of the term, "neurasthenia," who, in the latter part of the nineteenth century, first studied this ailment, subsequently known as the "American disease."

In his work, "Sexual Neurasthenia," Beard first called attention to the fact that though other factors may promote it, neurasthenia has a sexual origin, the weakened condition of the nerves being intimately related to the sexual life of the individual. He came to the conclusion that neurasthenia has its origin in abnormal functioning of the sexual organs by the observation that in patients who came to him with functional nervous diseases,

examination invariably showed that there was a condition of inflammation of the prostatic urethra. He wrote: "In men, as in women, a large group of nervous symptoms, which are very common indeed, would not exist but for morbid states in the reproductive system... A morbid state of this part of the body is both an effect and a cause of nervous exhaustion."

Beard then proceeded to determine what caused this morbid condition in the reproductive organs (inflammation of the prostatic urethra), which he considered the predisposing cause of neurasthenia. A study of the symptomatology of spermatorrhea, a disease characterized by an involuntary loss of sexual secretions (in the urine, after defecation, or at other times), led him to a solution of this problem. Beard noted that spermatorrhea was a frequent symptom of all kinds of neurasthenic as well as other debilitating diseases, and that there was a direct relationship between the amount of seminal fluid discharged and the intensity of the nervous symptoms. He also found that frequent nocturnal emissions likewise led to neurasthenic symptoms. "Seminal emissions," he concluded, are frequently the cause of nervous and other diseases." In spite of their universality (among civilized males, but not among animals), Beard believed that nocturnal emissions are pathological; and like spermatorrhea, a related condition of seminal emission, they are substantially cured, he stated. This, he claimed, by the conservation of nerve-nourishing seminal constituents that results, would markedly reduce the nervous symptoms thus produced.

As the result of his observations, Beard came to the conclusion that neurasthenia is a direct effect of the withdrawal from the blood of certain chemical substances needed for the nutrition of nervous tissue, which results from seminal discharges; and that the loss of considerable quantities of seminal fluid, involuntarily or voluntarily, leads to undernourishment of the cells of the central nervous system, causing them to be weakened and exhausted. He also pointed out that this condition is usually associated with an inflammatory state of the prostatic urethra "which is so often the source whence all these difficulties originate, and by which they are maintained." The prostatic urethra, he claimed, is the most important center of reflex irritation of the body, a morbid state of which is both an effect and cause of nervous exhaustion.

The next question that arises is: What is the cause of this congested and inflammatory condition of the prostatic urethra, which predisposes the individual to spermatorrhea and neurasthenia. This, Beard claims, is primarily a result of sexual indulgence, especially involving the practices of contraception and coitus interruptus. Neurasthenic symptoms also follow involuntary seminal emissions by night or day, whether they assume the form of excessive nocturnal emissions, diurnal emissions or true spermatorrhea. "There is quite a long series of diseases, symptoms and hygienic problems involved in the relation of the genital function to the nervous system," he concluded.

There appears to be a definite relation between disturbed functioning of the prostate gland and neurasthenia. In view of the fact that the prostatic secretion was found by Stern to contain "abundant amounts" of lecithin, which is an important constituent of nervous tissue, we can readily understand why the loss of prostatic secretion, a constituent of the

semen, should tend to cause undernutrition of nerve-cells by depriving them of lecithin, and thus bring about chronic undernourishment of the nervous system, manifesting in neurasthenia. For this reason, lecithin preparations have been used for years by European physicians for the cure of neurasthenia, and with marked success. But there is no sense in administering lecithin externally if the organism is losing its own physiological lecithin through seminal discharges, the dietary prevention of which should be the first step in the treatment of neurasthenia.

Concerning the relation between the prostate gland and neurasthenia, Dr. F. G. Lydston, professor of diseases of the genito-urinary organs and syphilology at the Medical School of the University of Illinois, says:

"Considering the abundant sensory and sympathetic nerve supply of the prostate and its intimate relation to the sympathetic nervous system in general, the frequency with which nervous symptoms develop in patients suffering from prostatic disease is not remarkable... Disturbed prostate may lead to the male equivalent of hysteria, to melancholia, headache and depression... It is the author's belief that the prostate secretes a hormone, the perversion of which, conjoined with the absorption of infection toxins, often has much to do with the etiology of sexual neurasthenia."

In his book, "Psychopathia Sexualis," Kraft-Ebing mentions a number of cases of neurasthenia caused by masturbation and sexual excess. In all these cases, the nervous derangement, which was often the starting-point of a mental derangement, had one primary cause: loss of prostatic and other seminal constituents through orgasms or involuntary seminal emissions. He considers sexual neurasthenia to commence, as a local neurosis of the genitalia, accompanied by frequent seminal emissions, and to progressively develop into a neurosis of the lumbar cord, accompanied by frequent nocturnal emissions, diurnal emissions and impairment of sexual vigor.

Professor Casper, of the University of Berlin, regards spermatorrhea and neurasthenia as going hand in hand, and that both result from excessive seminal losses through sexual excess, leading to involuntary emissions. In his "Textbook of Genito- Urinary diseases, speaking of spermatorrhea, he says: "Sexual excesses may cause the symptom, either directly or by causing neurasthenia. Of the sexual excesses, masturbation occupies first place. It must be conceded that if the habit is persisted in for years it will impair the soundness of both body and mind, that it will result in enfeeblement and hyperesthesia of the nervous system... Frequent pollutions may occur in certain organic diseases of the spinal cord, in the early stages of tabes and myelitis, for instance." Among the causes of nervous diseases Casper refers to coitus interruptus as a prominent one.

Modern studies of the etiology of neurasthenia trace this disorder to a disturbance in the functioning of the endocrine glands, which glandular dysfunction has a sexual causation. According to Dr. Harrower, "The more we study the neurasthenic individual and closely observe the incidental variations in functional activity, the more evident it becomes that neurasthenia rarely exists without some associated disturbance in the work of the ductless glands."

The fluids elaborated by the testes, the prostate gland and the accessory sex glands are very rich in phosphorus, as are the spermatozoa themselves. The loss of semen must therefore lower the phosphorus content of the blood, for it is from here that these glands derive the phosphorus for the manufacture of their secretions. This must deprive the nervous system of an element so necessary for its nutrition and normal well-being. This explains the neurasthenic effects of masturbation and sexual excess, which are due to loss of phosphorus through seminal emissions. The same occurs in prostatitis, where considerable phosphorus is lost through the expelled prostatic fluid. Lorand points out the beneficial influence of phosphorus when administered in many brain disorders, which are accompanied by a diminution of the phosphorus content of the brain, as Marie found in idiocy and dementia praecox. In the brain phosphorus is present chiefly in the form of lecithin, a phosphorized fat.

Dr. Evans, an English physiologist, has presented the interesting idea that thinking is merely a phase of phosphorus metabolism in the brain, which recalls the saying of German biochemists, "Ohne Phosphor keine Gedanken" (Without phosphorus, no thought). Evans states that during thinking and mental exertion, phosphates are increased in the excreta; and he therefore concludes that thinking involves an oxidation of phosphorus compounds in the brain (under the catalytic influence of the iodine of the thyroid hormone). Evans says: "If we take a fresh brain (either human or animal), and immerse it in either absolute alcohol, sulphuric ether or olive oil, we obtain a luminous solution of phosphorus." This may be the origin of the phosphorescent "brain glow" observed by Dr. G.W. Crile as given off by the living brain in a dark room. In this oxidation of phosphorus in the brain, Evans sees the origin of the generation of electric nerve-currents (for the oxidation of phosphorus in the atmosphere causes an electric discharge to be given off. Crile has shown that the electrical energy of the nervous system is generated in the brain, which represents a central storage battery of the body.)

It is thus clear that phosphorus, oxygen and sufficient thyroid hormone (iodine) are all necessary for the normal generation of brain electricity, and that in the absence of either of these three elements, there will be deficient brain action. For it is well known that the brain is richer in phosphorus than any other part of the body, and also uses up oxygen three times as rapidly as other tissues; also without the catalytic influence of the thyroid hormone, it cannot function normally -- or without iodine on which element the thyroid depends for the manufacture of its secretion.

According to this point of view, neurasthenia may be considered as representing a condition of phosphorus deficiency, or rather lecithin deficiency -- for lecithin is the form in which phosphorus is present in the myelin sheaths of the nerves, the nerve-oil whose burning keeps the fires of nerve vitality burning. Since lecithin is a prominent constituent of the semen, we can understand why excessive loss of semen can cause nerve starvation and all the symptoms of neurasthenia. When the lack of lecithin and organic phosphorus is more serious, the brain itself suffers lecithin deficiency and becomes disturbed in its functioning, just as any other starved organ is when deprived of the elements it requires for its normal nutrition and functioning. In this way, psychoses commence to manifest. From beri beri to polyneuritis, to psychoses, is only a transition or more graver nerve-

and-brain-cell starvation of the vitamin B complex and lecithin, both of which are intimately related and to a large extent replaceable. (Foods rich in vitamin B complex, like the germ of grains, legumes, Brewer's yeast, etc., are generally also rich sources of lecithin.)

That a basic cause of nervous and mental disorders is a lecithin deficiency in the organism, produced by excessive withdrawals of this substance to replace expended secretions (the semen, like nerve and brain cells, being very rich in lecithin) is probable. The action of alcohol, like that of anesthetics, is dependent on its activity to dissolve and remove lecithin from the brain; and when the concentration of brain lecithin is sufficiently lowered, insanity is the result. Sexual excess produces a similar effect; and, together with alcohol, constitutes a principal cause of neuropsychopathic conditions.

The modern view is that the origin of nervous and mental disorders is to be looked for in the endocrine glands. Now it is interesting to note that organic phosphorus, in the form of lecithin, is not only a prominent constituent of nerve and brain tissue but also of the endocrine glands, and is as necessary to the nutrition of the latter as it is of the former. Fenger, in an article, "Phosphatides in the Ductless Glands," points out that all the ductless gland, like nervous tissue, are rich in lecithin (phosphatides, phospholipins). An ether-extract of the pituitary gland was found to contain 62.61% lecithin. The anterior portion of the gland was found to contain ten times as much phosphatides (lecithin) as lean meat; the posterior pituitary, seven times this amount, being similar in composition to the brain. The pineal gland was found to contain thirteen times as much lecithin as lean meat. Jeleffy showed, the pineal gland is filled with neuroglia and rich in phosphorus; these neuroglia are believed to possess photo-sensitivity to ultra-violet rays. The corpus luteum of the ovary was found by Fenger to contain 15 times as much phosphatides as lean meat, and the suprarenal gland was found to contain the most of all, seventeen times as much as lean meat.

In view of these observations, we can understand the reason why Dr. Brinkley places the sex glands in the position of master glands in the endocrine chain, for they alone, through their external secretion, are able to withdraw considerable amounts of lecithin and phosphatides from the circulation, and thus directly affect the functioning of the other glands, which are so dependent on phosphatides for their normal functioning. The immediate effect of such sudden lowering of the phosphatide content of the blood, as the result of seminal emissions, is to produce hyperactivity of other endocrines. This explains the observed swelling of the thyroid gland during menstruation, and as the result of coitus, which is noticeable in women, in whom this gland enlarges and over-secretes at this time. For this reason hyperthyroidism and goiter have a relation to sexual excess. Enlargement of the thyroid gland in the bride the morning after the wedding has traditionally been taken as a sign that intercourse has taken place. But while the immediate effect of such phosphatide withdrawal is overactivity of the other endocrines, as a compensatory factor in the body's effort to maintain a normal concentration of phosphatides in the blood, the final effect is to produce underactivity and atrophy of the endocrines, due to chronic phosphatide deficiency; and this is why sexual excess leads to an earlier appearance of senility, a condition resulting from endocrine hypofunction and

degeneration. Thus the basic cause of endocrine dysfunctions--hypoactivity or hyperactivity--is to be found in the sex glands and their ability to alter the lecithin or phosphatide content of the blood, which is the primary raw material from which the endocrines manufacture their hormones.

There is no time in life when the endocrine glands of the individual may be more powerfully affected by a deficiency of phosphatides than during the months of embryonic development, when these glands are most sensitive to their chemical environment, the maternal blood-stream. Deficiency of phosphatides in the mother's blood at this time, due to ovarian overactivity (as the result of sexual intercourse) may affect the development of the thyroid and other endocrine glands of the embryo, as well as of its central nervous system. This explains the origin of cretins and Mongolian idiots, when born of parents with normal heredity. Prof. M. Schlapp, neuropsychiatrist of the New York Post-Graduate Hospital, has made a special study of this problem, studying hundreds of cases of cretins born of normal parents, and his conclusion is that a prenatal injury to the thyroid and other glands of the embryo by an endocrine disturbance in the mother was the basic cause of such conditions. He noted a preponderance of such children born from adolescent mothers or those approaching the climacteric, when the ovaries tend to be most active. Dr. Schlapp believes that glandular depletion of the mother during gestation is the basic cause of the production of cretins and idiots, when there is no direct hereditary causation. It is clear that such "glandular depletion" can result from the excessive withdrawal of phosphatides from the mother's blood as the result of sexual intercourse during pregnancy, which also tends to produce endocrine dysfunction in the form of glandular hyper-and-hypoactivities.

The phosphatide withdrawal caused by activity of the sex glands and seminal emission exercises a most powerful effect upon the thymus glands, which are most dependent on adequate phosphorus supply for their normal well-being and activity. Now it is interesting to note that coincident with the increased activity of the sex glands at puberty and the subsequent withdrawal by them of phosphatides, the thymus gland degenerates. Such degeneration may be viewed as a product of lecithin deficiency, similar to the endocrine degeneration which McCarrison notes to result from vitamin B deficiency. If lack of vitamin B causes the thymus to degenerate, lack of lecithin, which is similar in its action, should do the same. Experiments on animals have shown that the thymus is more easily affected than other glands by deficiency of phosphorus and vitamins in the diet, and atrophies when deprived of these elements. The lymphoid cells of the thymus, according Chittenden, contain 3.5% of a nucleo-protein rich in phosphorus.

According to Hammar, the thymus increases in weight from 5 grams at birth to 25 grams at puberty, after which it commences to diminish, losing 5 grams between the ages of 15 and 25. However there are individuals in whom this thymus degeneration does not occur and in whom the thymus persist throughout life. According to Berman, Raphael, noted for his chastity, was such a thymocentric individual in whom thymus degeneration did not occur. It is probable that phosphatide starvation as the result of the seminal emissions of puberty cause the customary degeneration of the thymus at this time. This results from a disturbance of phosphorus metabolism, which leads to a similar disturbance of calcium

metabolism. Basch found considerable excretion of calcium in thymectomized animals, which leads to ricket-like symptoms.

The parenchyma of the thymus contains nucleinates rich in phosphorus. Nucleohiston, the most important protein of the thymus, contains 3.7% phosphorus. The richness of the thymus in phosphorus shows that it is important not only for the proper development of the bones, but also the brain, for which reason premature atrophy of the thymus leads to the appearance of idiocy. At the Bicetre Hospital, according to Morel, 75 per cent of non-myxedematous idiotic children, from one to five years old, showed absence of the thymus gland on post-mortem examination. Bourneville also found absence of the thymus in 28 feeble-minded children examined. Basch, Kloss, Vogt, Morel and others observed mental disorders in puppies the fifth or sixth month after removal of the thymus. The animals appeared idiotic and retarded in development. Both bone and brain deformities appeared as the result of the phosphorus deficiency thus produced.

That the internal secretion of the sex glands may have a nutritive function in relation to nervous tissue and brain cells, and that mental diseases may result from its absence, is indicated by the observation of McCarrison, who found that atrophy of the testicles is frequently found in cerebral and spinal diseases. Thorek, in his work on the testis, notes developmental defects in the reproductive system of idiots and cretins. Todde found diminished weight of the testicle in 88% of 25 cases of dementia praecox studied. Many physicians also noted an improvement in dementia praecox after gland transplantation. Frequently, in operating upon women having dementia praecox and other psychoses, atrophied ovaries are found. Neurotic phenomena usually follow the removal of the ovaries. Matsumotot, in study of 20 cases of dementia praecox, found cessation of spermatogenesis.

These facts indicate an intimate relation between spermatozoa and the cells of the cerebral cortex, absence of the formation of the former leading to decline of the latter. There is evidence that spermatozoa, when not discharged, are resorbed into the blood-stream and carried to the brain. Both in their chemical composition and their elongated form, they have a remarkable similarity to brain-cells, which, like them, lack the capacity of reproduction, in contrast to most other cells of the body which have this capacity. Could spermatozoa, passing to the brain and spinal marrow, have a relation to the mobile neuroglia, which likewise move about by flagellated motions of their tail, and which are potential cells of the central nervous system? This is an interesting speculation. Norret must have had some such thought in mind when he remarked, "The resorption of what Dr. LeCamus called a mass of microscopic brains is a source of vigor and longevity."

That the semen contains substances of great physiological value, especially in relation to the nutrition of the nervous system, is clear from its chemical analysis, which shows that it is extremely rich in lecithin, cholesterol and phosphorus, the chief constituents of nerve and brain tissue. It therefore follows that the withdrawal of these substances from the circulation by seminal discharges (voluntarily or involuntarily) must have an adverse effect on the nutrition of nerve and brain tissue and result in disturbed functioning. Such biochemical consideration support the view that loss of seminal fluid involves lowered

nutrition of nerve and brain tissue, and, when excessive, to nervous and mental disorders. The remarkable similarity in chemical composition between the semen and the central nervous system indicates such a relationship. Older physiologists suspected this fact. Hoffman wrote:

"One easily understands why there is so intimate a connection between the brain and the testicles, since these two organs separate from the blood the most exquisite part of the lymph... The seminal fluid is distributed in all the nerves of the body; it seems to be of the same nature." (Could this "most exquisite" part of the lymph which both the testicles and the brain extract from the blood be lecithin?)

That the semen contains substances of great importance for the nutrition of the central nervous system was clearly shown by the isolation from the semen of Spermine, the active principle of testicular extracts, by Poehl, a Russian physiologist. Poehl found that when Spermine was injected into animals it acted as a catalyst of cell activity, resulting in an increased rate of oxidation in all tissues, metabolic processes being accelerated and nervous vitality increased. The effects were similar to those observed by Brown-Sequard after spermatic injections. Since Schreiner, the discoverer of spermin, had shown in 1878 that it is a normal constituent of the semen, this indicates that the latter acts as a nerve stimulant in the organism in which it is formed and resorbed, and that its loss must deprive the nervous system and brain of its stimulating action. It may be for this reason that natives in some parts of Australia, according to Havelock Ellis, administer a potion of semen to feeble and dying members of their tribe.

Both the semen and the brain are composed largely of phosphorized fats, or phospholipins, to which class lecithin belongs. Lecithin is a substance of great importance for the nervous tissue. It is claimed by some that the nerve fatigue experienced at the end of the day's activities is due to an exhaustion of the daily supply of lecithin in the myelin sheaths of the nerves, and that the invigorating effect of sleep is due to this lecithin being replenished during the night. The chronic fatigue of old age is considered to be due to a lecithin deficiency of the endocrine glands and the body as a whole. Lecithin is essential to the life of the nervous system, the brain and the endocrine glands. Alderhalden, in his "Physiological Chemistry", describes the distribution of lecithin as follows: "It occurs principally in animal tissues, in the brain, nerves, fish-eggs, yolk of eggs and in the spermatozoa." According to Prof. Sajous, lecithin is "a conspicuous component of the brain, nerves, yolk of egg and the semen."

Now since both the brain and the semen depend for their supply of lecithin on what exists in the blood, it is clear that excessive withdrawal of lecithin by the sex glands would mean that a smaller amount would be available for the nutrition of nerve and brain tissue. May not neuroses and psychoses be due to such diminished nutrition of nerve and brain cells due to such diminished nutrition of nerve and brain cells due to excessive withdrawal of lecithin and cholesterol from the blood to replace expended seminal secretions? The tonic effect of lecithin preparations upon the nervous system would indicate that the conservation of the body's own lecithin should constitute a therapeutic measure of primary importance in the treatment of neurasthenia and mental disorders.

Lecithin is readily combustible, and containing a large amount of stored potential energy, it is well adapted to sustaining the ceaseless activities of the brain and nervous system, as well as the respiratory organs, through its oxidation, which releases nerve electricity. As oil burns in the fine ramifications of a wick so does lecithin burn in the fine ramifications of the nerve fibers.

The only other part of the body that can compare with brain, nerve and endocrine tissue in high content of lecithin is the semen and spermatozoa, for like the brain, the semen is a fatty substance rich in phosphorized fats, the phosphatides or phospholipins. That considerable lecithin is required for the forming of spermatozoa is indicated by Miescher's observation that the amount of lecithin in the blood is increased during the period of formation of the reproductive cells.

The fat content of the human blood is about 2 per cent. It is present either combined with phosphorus as the group of esters known as the lecithins, or with waxy alcohols in the form of cholesterols. The concentration of these substances, both of which are constituents of the semen and the brain and nerves, often vary, depending on intake and outgo; thus the eating of egg yolk can increase the concentration of both. Activity of the sex glands causes withdrawal of both. This means a lessened supply available to the nervous system. Neurasthenia may be the result of such lecithin and cholesterol withdrawals, which, if excessive can lead to actual psychoses.

One of the earliest discoveries about the chemistry of the brain is its high content of phosphorus, which is either combined with proteins and sugar as nucleo-proteins, with proteins alone as phosphoproteins, or with lipoids as phospholipins, to which group lecithin belongs. On the basis of such observations arose the saying of Moleschott and Liebig, "There can be no thinking without phosphorus." Thus started the tradition that phosphorus and foods rich in it are good for one leading a brainly life. Dr. Louis Berman, biochemist, suggests that the properties of characteristic of the brain are connected with the presence of phospholipins (oxygen-poor fats combined with phosphoric acid) within it. "That they increase in amount proportionate to the degree of complexity of the nervous system as it gets older and more learned also supports the view of their importance," he observes, so answering himself a question he elsewhere brings up in another part of his book, "Food and Character": "No one has yet isolated the various substances which make for the best metabolism of the nerve cells, and their quickest recovery from fatigue. When these substances will be in our hands, the chemistry of the superman will be in view. The artificial creation of mentally superior human beings will then become the definitely achievable ultimate goal of chemistry." These substances for the best nutrition of nerve and brain tissue are without doubt the phospholipins, including lecithin. They are present in the semen and internally fed to the body when the seminal fluid is conserved and resorbed, rather than wasted. It then becomes a true internal nerve and brain food.

The gray matter of the brain contains 17% lecithin, which is the essential and indispensable medium through which the higher intellectual processes manifest themselves. The greater the purity in which lecithin is found, the higher the intelligence of the animal, even in insects. The superior acuteness displayed, for instance, by bees and

ants, is due to this fact. The quality of these highly organized phosphorus compounds (i.e., lecithin) appears to be vitally connected with the intellectual capacity of the brain. In idiocy and insanity there is a qualitative and quantitative diminution of brain lecithin.

That insanity might be due to a deficiency of lecithin in the brain, resulting from a deficiency in the blood, is indicated by the observations of Lassaigne, who found a decreased quantity of lecithin in the white brain matter of the insane. Commenting on this subject, Fischer, a French biochemist, states: "The content of the brain in combined lipoids seems, then, to have some relation to intellectual power and to its modifications as well." Similarly, insanity due to alcohol has been shown to be due to the same cause, since alcohol is a lipoid solvent. It has been shown by experiment that in the series of agents which act as narcotics, the anesthetic power increases in proportion to the quantity of lipoids that the liquids employed are capable of dissolving from the brain. Chloroform and ether both possess the property of dissolving lipoids, as was shown in 1905 by Overton, the discoverer of the lipoids. It has also been shown that after anesthesia, ether and chloroform accumulate in the nervous tissues. The experiments of Niclous and Frison have proven that the white matter of the brain, which contains twice as much lipoids as the gray, can fix twice as much chloroform. May not the deep unconsciousness that follows sexual activity be due to withdrawals of lipoids from the brain by the sexual orgasm, producing results similar to those that follow the administration of an anesthetic, which likewise withdraws lipoids from this organ?

Since both the brain and the sex organs extract identical substances from the blood (lecithin, cholesterol, etc.), this would mean that there exists a chemical antagonism between them since increased activity of the latter means decreased nutrition of the former. The more lipoids that the sex glands withdraw from the blood, the less is available to the brain. This is confirmed by the observation of Darwin that the brain of rabbits diminishes in size under domestication. It is well known that domesticated animals have more frequent estrual periods and reproductive activity than wild ones. The diminished size of the brain in the domesticated species is associated with greater sexual activity and resulting withdrawal of brain lipoids.

These considerations indicate that all loss of seminal lipoids, whether through coitus, masturbation or nocturnal emissions, are at the expense of the brain: and this effect is most detrimental during childhood and before maturity, when the brain is in the process of growth. Chakraberty, discussing the adverse effect of seminal losses upon the brain, writes: "The loss of concentration of lecithin and phosphates becomes a serious drain on the nervous system. Lecithin and phosphates are the principal components in the structure of the brain."

Continence results in a greater supply of lecithin, cholesterol(?) and phosphates in the blood, and consequently in the brain. Brown-Sequard has shown that testicular secretions increase nerve and brain vitality. Chakraberty remarks that the eating of desiccated testicles has a stimulating effect on the central nervous system "due to the nucleo-albumins, lecithin and phosphorus in which they are so rich, and which are also prominent constituents of nervous tissues." (However, there is no need to eat desiccated

testicles when each individual can conserve and resorb the valuable secretions of his own). According to Fischer, the sex glands may be considered as reservoirs of lipoids, which they release into the blood to energize the brain. And conversely, through external emission, they can withdraw lipoids from the blood, and thus indirectly from the brain.

No adequate comprehension of the sexual question can be had without understanding the chemical composition of the semen and spermatozoa. When it is realized that they contain in high concentration phospholipins essential to the nutrition and normal functioning of the central nervous system, it will be realized that withdrawal of these substances from the body by seminal emissions must have an adverse effect on the nutrition of the brain and nerves, predisposing to neurasthenia and other nervous and mental affections. Here we have the biochemical basis for a new neurology and psychiatry.

### **CHEMISTRY OF THE SEMEN**

Seminal fluid is composed of the secretory products of the testis, epididymis, seminal vesicles, prostate gland and Cowper's gland. It is a viscid, albuminous fluid, alkaline in reaction and opalescent in color. The average amount given off at each ejaculation, which varies with individuals and with the same individual at different times, is about 5 grams. In each ejaculation about 226 million spermatozoa are believed to exist.

Human semen contains 90 per cent water and 10 per cent solids which when incinerated yield 1 per cent ash. The quantitative analysis of the ash reveals a large amount of calcium and phosphorus. According to Lode, the amount of calcium given off at one ejaculation is about 0.01 gm., which exceeds that in an equal quantity of lime water. As we have mentioned, the semen also contains a substance named spermine, which is a powerful metabolic stimulant and has been so recommended by Poehl in 1898. Spermine has also been found to be present in the gray matter of the brain. This may explain its nerve-invigorating properties, which resemble those of lecithin, also present both in the semen and the brain.

The physiological chemist, Simon, describes the semen, as a thick, whitish, glutinous mass containing cholesterin, which he calls "brain fats", and lecithin, a phosphorus-containing fatty constituent of brain substances. If the semen is allowed to stand until it evaporates, Simon notes that it deposits a film of prisms composed largely of phosphate of lime. On heating it gives off ammonia, leaving a carbonaceous mass containing sodium chloride, calcium phosphate and magnesia. According to Lode, the ash of the semen contains 20% calcium and 30% phosphoric acid.

Chakraberty describes the composition of the semen as follows: "The protein substance consists of nucleoproteins, traces of mucin, albumin and a proteose, and is relatively richer in nuclein than any other part of the body. The mineral bodies are calcium, phosphorus, sodium chloride and potassium." It is thus clear that emissions of semen can withdraw considerable minerals from the body, and so predispose to mineral deficiency, in addition to the withdrawal of lecithin, cholesterin and nucleoproteins.

It is to its prostatic components that the semen owes its milky turbidness and peculiar odor. This milky turbidness is due to the lecithin globules (fatty-nitrogen-phosphorus compounds) of the prostate gland, the decomposition of which leads to the odor. The prostatic secretion also contains sodium, potassium, calcium, magnesium, chlorides, phosphorus, sulfur, nucleoproteins, albumin, etc. In a paper, "The Constitution of the Normal Prostatic Secretion" (Am. Jour. Med. Sciences, Aug., 1903), Stern points out the presence in the prostatic secretion of "abundant amounts" of phosphorus-containing lecithin, an essential constituent of nervous tissue. The loss of this deprives the nerve cells of nourishment; and this explains the relation between prostatitis and neurasthenia. No two organs show greater similarity in their lecithin, cholesterin and phosphorus contents as the semen and the brain. The analyses of Slowtzoff, Miescher and Lode show the semen to contain:

**PROTEINS** (Albumin, nucleoproteins, globulins, 2.65%mucin, nuclein, proteose, protamin, hemialbumose, alkali albuminate)

**LIPOIDS** (phosphorized fats, including 0.412% lecithin)

**CHOLESTERIN** 0.208%

**MINERALS** (phosphorus, sodium, potassium, 0.910% calcium, magnesium, iron, sulfur, chlorine)

The high concentration of lipoids (lecithin, etc.) in the semen, rivaled only by that in the brain, is striking. Wheelon(?) writes: "The beneficial results following the administration of testicular preparations have been considered due to the presence of nucleo-albumin rich in phosphorus, resembling lecithin or glycerophosphates (Sajous). Microscopic studies have definitely shown the presence of fatty particles in the interstitial cells and lymphatics of the testis, the fat content varying with the sexual cycles. Certain investigators, especially Duesberg, contend that these microscopic bodies represent the internal secretion of the testes." The interstitial cells of the testis, like the brain cells, are characterized by richness in lipoids.

## **CHEMISTRY OF SPERMATOZOA**

No investigator has more carefully studied the chemistry of any cell than Miescher in his studies of the spermatozoon. He found its tail to be very rich in phosphorized fats (phospholipins), particularly lecithin, and also cholesterin, while the head consists almost entirely of nucleoproteins and an organic substance containing iron, besides abundant amounts of phosphorized fats. According to Miescher, the tail of the spermatazoon has the following composition:

Protein 41.90% Phosphorized fats (lecithin) 31.83% Cholesterin 26.27%

The spermatazoon as a whole contains:

Protein 83.76% Lecithin 7.47% Other fats 4.53% Cholesterin 2.53% Chakraberty describes the tail of the spermatazoon as being composed of proteins, lecithin, cholesterin and lipoids, and states that "its composition resembles the non-medulated nerves or the axis-cylinder."

According to Meischer, the head of the human spermatazoon consists entirely (96%) of a substance very rich in nitrogen and protein, belonging to the group of compounds known as nucleo- proteins. The other four percent of the substance of the head of the spermatazoon consists of lecithin, cholesterin, fat, calcium phosphate, calcium carbonate and an organic substance containing 0.12% iron.

Miescher found a higher concentration of lecithin in the blood of fish at the time of spermatogenesis than normally, which indicates that a considerable amount of lecithin is withdrawn from the circulation for the formation of spermatozoa. He also observed that in the salmon, the sexual organs develop at the expense of the muscular system and that the proteins deposited in the testes for the formation of spermatozoa is derived from the protein of the muscles, since the fish does not take in any food during this period. He noted that during the breeding season the muscles of the salmon atrophied to the degree that the sex glands became more active. Marshall remarks on this subject, "In the salmon, the material for the growth of the testis is supplied by the muscles undergoing atrophy."

In the human subject a similar relation has been noted. It should be observed that the adrenal glands and the testes are embryologically and histologically closely related. The excessive withdrawal of lipoids from the blood by the sex glands is at the expense of the adrenal cortex, just as the withdrawal of protein observed by Miescher is at the expense of the muscles. Excessive gonadal activity, by depriving the adrenal cortex of lipoids, leads to its atrophy. Thus, in cases of dementia praecox, many of whom were habitual masturbators, there was noted by Mott atrophy of the adrenal cortex together with progressive atrophy of the testicles. It has also been noted that excessive withdrawal of nucleoproteins and other substances from the blood to form spermatozoa may cause diminution in the size of the thymus gland and its atrophy, which probably is the reason why this occurs after puberty. (Could the atrophy of the pineal gland, accompanying that of the thymus, not be due to a similar cause, in view of the richness of the pineal in lecithin?) Prof. Sajous shows that thymic tissue and lymphocytes are remarkably rich in nucleins, as are the heads of the spermatozoa.

Backmann found that the thymus attains its greatest size and weight just when the spermatogenesis commences, after which it starts to atrophy. Hammar noted that the thymus increases in weight from birth to puberty, but as soon as the first seminal emissions occur, with the onset of puberty, it commences to retrogress and lose weight. These facts indicate that the sexual changes of puberty, instead of being the effect of thymus atrophy at this time, are the cause.

Ostwald states that the spermatozoon contains an oxidizing ferment which acts on the ovum during fertilization and initiates its development. Loeb considers this oxidizing

ferment to be lysine, whose action on the cell wall of the ovum starts embryonic growth, which can occur without fusion of cell nuclei.

The proteins of the brain cell and those of the head of the spermatozoon are very similar. Both contain abundant amounts of nucleic acid, and the head of the spermatozoa, like the Nissl substance of the brain cell, is very rich in nucleoproteins. Both the spermatozoon and the cortical brain cell are remarkably similar in their general formation. It is significant that the spermatozoon contains more phosphorus than any other cell of the body except the brain cells; and since with each ejaculation 226 million spermatozoa are given off, it is clear that in this way a considerable amount of phosphorus is lost, in addition to the phosphatic constituents of the semen.

## **CHEMISTRY OF THE BRAIN**

Modern knowledge of brain is comparatively recent and goes back to 1910 when Thudischem published "Die Chemische Konstitution des Gehirns des Menschen und de Thiere" (Chemical Composition of Human and Animal Brains). It was early realized that the most striking difference between the chemistry of the brain and that of the rest of the body is the large quantities of lipoids it contains, especially lecithin. Nerve and brain tissue are fatty substances; approximately half of this fat is cholesterin and approximately half consists of lipoids, half of which is lecithin.

No tissues in the body contain such a large quantity of fatty, alcohol-soluble substances (i.e., lipoids) as the brain, with the exception of fat tissue itself. The lipoids of the brain, however, are almost entirely free from neutral fat. These lipoids contain large amounts of phosphorus. These phospholipins have a very important function in the brain and increase in quantity with its development. The most important of them is lecithin. The growth of the brain in infancy has been found to be proportional to the lecithin content of the milk. Human milk, intended to nourish a more rapidly growing brain, therefore contains more lecithin than animal milk.

Brain lipoids are of two kinds. Some, like lecithin, are found in other organs, while others, like cephalin, phrenosin and keratin, are found only in the brain. The white matter of the brain contains twice as much cholesterin as the gray matter; the latter, on the other hand, contains twice as much lecithin and three times as much cephalin. This explains the reasons for Lassaigne's observation that in insane subjects the amount of fat and lecithin in the brain decreases in enormous proportions.

Students of the physiological chemistry of the central nervous system emphasize the fact that in the active protoplasm of each nerve and brain cell, lecithin and cholesterin are the most prominent constituents. They are also the principal constituents of the semen, which, like the brain, is also a fatty substance. These facts clearly indicate the existence of an important biochemical relationship (through the medium of the blood) between the semen and the central nervous system: Lecithin, according to Sajous, is "a conspicuous component of the brain, nerves, yolk of egg, semen, pus, white blood corpuscles and the electrical organs of the ray." Concerning the importance of lecithin to the nerve cells, he

says: "Lecithin, therefore, becomes the functional ground-substance of the cell- body of the neuron, just as it is in the nerve. Both in the neuron and its continuation, the nerve, therefore, the vascular fibrils carry blood-plasma, which, by passing through their walls, maintains a continuous reaction, of which the phosphorus of the lecithin and the oxygen of the blood-plasma are main reagents, and chemical energy is the end-result." According to Duval's observations, functioning nerve tissue is the seat of intense combustion accompanied by the liberation of heat; in view of Evan's deductions, this should consist chiefly in the oxidation therein of organic phosphorus compounds (i.e., lecithin).

Concerning the large amounts of phosphorus in the brain, Professor Mathews, the physiological chemist, says, "Not only do we find compounds of phosphorus in the protoplasm of the brain (and its importance was emphasized by Thudischem by the selection of the phosphatide, to indicate that the other radicals are grouped around it), but phosphorus occurs in large amounts in the nucleus and in phytin; it helps regulate cell reactions." Among the phosphatides (phospholipins) that compose the largest part of the solids of the brain are: lecithin, cephalin, myelin, sphingomelin, amino-myelin and paramyelin. Besides the phospholipins are the glycolipins, which include phrenosin, kerasin, cerebron, homcerebrin, and cerebric acid. There are also amino-lipins, or nitrogenous fats. The medullary sheaths surrounding the nerves are composed of glycolipins (cerebrosides), phospholipins and cholesterol. Sajous states his conviction that the myelin of the nerves is not a mere insulating material or sheath, but a phosphorus-containing substance (lecithin) which, when in contact with oxygen-laden blood, generates nerve-electricity through oxidation. The importance of sufficient lecithin to keep the myelin sheaths properly nourished is therefore apparent. Could not the symptoms of neurasthenia, i.e., diminished generation of nerve-electricity, be due to lecithin deficiency as the result of seminal withdrawals? Lipins, including lecithin, play a role in maintaining of irritability of the nerves. Mathews believes, with Sajous, that the lecithin and lipins of the myelin sheaths have a nutritive function in relation to the nerves. Tashiro showed that nerve fibers are centers of the most active metabolism of any cells of the body, and that they are nourished by the lipoidal substances of the sheath that surrounds them, namely, the phosphatides. It is therefore clear that phosphatides, most important of which is lecithin, are of great importance to the nutrition of the nerves, and that an abundant supply of them in the blood makes for the best nutrition of nervous tissue, while a deficiency, as is caused by excessive activity of the sex glands, leads to under-nutrition and diminished functioning of nerve and brain cells, which can lead to the appearance of neuroses and psychoses.

According to Mathews, the materials of which the medullary sheath of the nerves is composed are galactose, inosite, fatty acids, phosphoric acid, sulphuric acid, potassium, calcium and sodium besides abundant lecithin. Mathews states that in order to fulfill its nutritive function in relation to nerve cells, the myelin sheath contains a reserve of phospholipins (lecithin). The more rapid the metabolism of the nerve fiber, the larger the quantity of such nutritive substances that pass from the myelin sheath to the rest of the nerve cell.

In view of these considerations, neurasthenia should be viewed as a condition of lipoidal undernutrition of nervous tissue due to a lack of lecithin and phosphatides in the medullar sheaths. Sexual neurasthenia is obviously due to the withdrawal of these substances from the blood by the sex glands and their discharge through the semen.

According to Petrowssky, the gray and white matter of the brain have the following composition:

Parts per 100 Gray Matter White Matter

Water	81.62	68.25	Fixed residuum	18.28	31.75	Albumen and keratin	11.42	8.87	Lecithin
3.16	3.14	Cholesterin and fats	3.44	16.64	Cerebrin	0.10	3.01	Minerals (potassium, sodium, calcium, magnesium, iron, phosphorus, chlorine, sulfur)	0.26 0.18

The albumens found in the brain are similar to those in the semen. Both are composed chiefly of albumen and lipoids; and both contain more cholesterol, lecithin and phosphorus than other parts of the body. The brain also contains cephalin, cerebrosides, cerebric acid, myelin, neuroplastin and lactic acid.

It is interesting to note that the cerebro-spinal fluid, like the semen, is rich in calcium, phosphorus, sodium, magnesium and chlorine, and has an alkaline reaction. The ancients note a relation between the semen and the spinal cord, and Hippocrates believed that involuntary seminal losses can cause tabes dorsalis. That they cause spinal weakness is well known.

That the sex glands and the brain have an intimate physiological connection with each other, which is antagonistic in the sense that greater activity of one leads to decreased activity of the other, has been stated by Havelock Ellis in the following words:

"The brain and the sexual organs are the great rivals in using up bodily energy, and there is an antagonism between brain vigor and extreme sexual vigor, even though they may sometimes appear at different periods in the same individual. In this sense, there is no paradox in the saying of Roman Correa that potency is impotency and impotency potency, for a high degree of energy, whether in athletics or in intellect, is unfavorable to the display of energy in other directions.... The masters of all the more intensely emotional arts have frequently cultivated a high degree of chastity. This is notably the case as regards music. One thinks of Mozart, of Beethoven, of Shubert. At the age of twenty-five, when he had already produced much fine work, Mozart wrote in a letter that he had never touched a woman."

Dr. Ryan expressed a similar thought when he wrote:

"Bacon observed that no one of great genius in antiquity had been addicts to women; and he stated that among the moderns the illustrious Newton had never enjoyed sexual intercourse. This fact confirms the remark made by Aretaeus, and since verified by physiologists, that continence, or the reabsorption of the semen into the bodily economy,

impresses the whole organism with an extreme tension and vigor, exciting the brain and exalting the faculty of thought."

## NEURASTHENIA AS A LECITHIN DEFICIENCY DISEASE

That neurasthenia is the result of lecithin starvation of nerve cells, due to sexual withdrawals of lecithin, is indicated by Dr. Bernard Talmey, eminent American sexologist, in a paper entitled, "Sexual Problems of Today, with a Case of Hysterical Insanity Caused by Excessive Masturbation," in which he writes:

"The percentage of neurasthenia of sexual origin is so large that it is always well in the presence of this anomaly to look for sex as a fruitful cause. There is an intimate relation between the genitals and the head... The two perversions, masturbation and onanism (congressus interruptus of Onan) are oftener the cause of the general breakdown than excesses in normal sex life. Of these two, masturbation is the more dangerous because its practice usually begins in the immature child, and if indulged in to excess, leads to fatigue and exhaustion of the central nervous system."

On the same subject, writing on the causes of nervous debility, Dr. Frederick Humphrey says that it "is almost invariably the result of some drain upon the vital forces, such as excesses of various kinds: excessive morbid indulgence, involuntary losses of vital fluids, too long and too constant excitement of the sexual system, and more especially when such indulgences are allowed in connection with mental and physical overwork. Nervous debility is often brought on in young persons by the habit of masturbation, which, if persisted in from time to time, is inevitably followed by consequences immediate and remote, and are of the most formidable character. It is safe to say that multitudes are every year brought into the most deplorable condition of nervous debility from these very pernicious practices alone."

Dr. El Lernanto writes: "In the male sex, nerve-exhaustion manifests itself by spermatorrhea or involuntary loss of semen, due to sexual gratification and other gratifications of the passion in and out of the marital relation, both in adults and youths."

In an article, "Sexual Neurasthenia and the Prostate" (Medical Record, Feb., 1912), Prof. F. G. Lydston presents evidence to prove that neurasthenia has its roots in prostatic dysfunction caused by sexual indulgence, which results in depletion and derangement of the prostatic hormone. He writes:

"There is almost always some functional derangement of the sexual apparatus behind which lies a varying degree of organic disorder (in neurasthenia). My experience leads me to the conclusion that neurasthenia in the males is associated with prostatic hyperemia and hyperesthesia of the prostatic urethra more than with any other condition.... Practically all of these subjects have been masturbators, many of them have indulged in sexual excesses, and not a few have had gonorrhea.... I doubt if it is possible for one to indulge in either masturbation or sexual excess for any length of time without producing disturbance of prostatic circulation and innervation... Practically every masturbator who

has practiced the habit for any length of time may be considered as having a more or less tender and swollen prostate. My experience goes to show that this condition underlies many of the cases of nocturnal emissions with which we meet."

Professor Casper considers masturbation and excessive coitus as the true causes of neurasthenia, writing, "In general it may be stated that masturbation is more prone to produce cerebral neurasthenia, while excessive sexual intercourse tends rather to cause the spinal form."

Dr. Allen, in a paper, "Etiology and Pathology of Impotence," considers masturbation and sexual excess as the causes of impotence, producing as they do inflammation and congestion of the prostatic urethra, a condition predisposing to nocturnal emissions and spermatorrhea, which precipitate loss of functional activity of the testicles, which is the essential feature of impotence. According to Prof. Lydston, nocturnal emissions always denote a condition of inflammation and congestion of the prostatic urethra, which can pass into a more serious form, if not cured, as diurnal emissions and spermatorrhea, the underlying causes of which are masturbation and sexual excess.

### **THE PROSTATE SECRETION AND NEURASTHENIA**

Physiologists in the past knew little concerning the function of the prostate gland. Steinach found that its secretion facilitates fertilization, since spermatozoa are impotent without it. As time went on, the idea that this gland is a true endocrine headway; and in addition to prolonging the life of the spermatozoa, observers were agreed that "the secretion of the accessory glands (including the prostate) may perform other important functions."

That resorbed prostatic secretions have a nutritive effect on the spinal cord is indicated by the experiments of Engles who found that the injection of an extract of the lumbar cord of a buck resulted in the cure of impotence and catarrh of the prostate. Chemically and physiologically, there appears to be a close relationship between the spinal cord and prostate glands. The removal of the prostate through prostatectomy, which leaves the patient physically, nervously and mentally incapacitated, has also shown that this gland has an important hitherto unsuspected physiological function. Such observations have led Macht to ask, "Can such an impairment in mental efficiency be attributed to the extirpation of the prostate gland and the consequent deprivation of an internal secretion elaborated by it?"

Macht attempted to answer this question by experiment. He found that when young rats are prostatectomized they show a distinct weakness of the hind legs and are slower to learn than non-prostatectomized animals. That this was not due to the operative technique itself but to the fact that when the prostate is removed there is an absence of its specific internal secretion, is indicated by the fact that when the testes were removed there was no such muscular incoordination and weakness as followed the removal of the prostate. The prostatectomized rats improved when fed on gland substance. These observations indicate that the prostate gland produces a hormone essential for the well-being of the

spinal cord and that deprivation of this hormone injures the cord and results in disturbed functioning.

In an article, "The Prostate Gland as an Endocrine Organ," Macht writes:

"The experiments on the tadpoles, revealing a distinct influence of prostate feeding on the growth and development of the animals, and the data so far in hand concerning prostate feeding in higher animals, speak very strongly in favor of an endocrine function of the prostate gland. These experiments, together with those of Serralach and Pares, would seem in the author's opinion, to be the chief evidences in favor of such a function... Feeding with prostatic substance exerts an influence upon the growth and differentiation of tadpoles. This, of course, would speak in favor of an internal secretion of the prostate gland." Macht and Bloom noted an atrophy of the testes in rats when the prostate was removed. According to Hunt the prostate functions in connection with the testis in the production of sex hormones.

In an article, "New Theory of the Function of the Prostate" (Endocrinology, Nov. 1925), Dr. Hunt presents evidence to prove that the testicles are not alone responsible for the production of sex hormones. He cites a case of diminished sex function in a man with a hypertrophied prostate, removal of the prostate leading to complete cessation of sex function. A ram's testicle was then successfully transplanted. Though this resulted in an increase in nervous vitality, no sexual change occurred. However when a bull's prostate was implanted, sex desire and function were re-established. Such observations led Dr. Hunt to conclude that "the prostate is definitely responsible, with the testicle, both for sex function and sex desire.... Hypertrophy of the prostate occurs too often with the onset of impotence or diminished function to be attributed to mere coincidence."

Hunt's view is further supported by Dr. W. Belfield of Chicago who claims to have clinical evidence to prove that the testes and ovaries are not the sole seats of sex hormone production, and that other glands take part in their formation. He has come across cases in which there was complete development of sexual traits though the sex glands were absent, nor were there signs of castration. In other cases the individual was sexually normal though he possessed glands of the opposite sex. Belfield therefore concludes that there is "a force independent of the gonads which enters into the determination of the sex features." Blair Bell holds a similar view, based on the study of the sex glands of hermaphrodites. He claims that all of the endocrine glands, and not exclusively the sex glands, enter into the determination of sexual traits.

It appears that the internal secretion of the prostate gland accelerates growth and metamorphosis by its stimulating influence on the thyroid and pituitary gland, which Macht believes is the reason for the increased growth of tadpoles when fed on prostate substance. Indicating the importance of the prostatic secretion (which is present in the semen) to the nervous system, Prof. Lipschutz writes: "It is said that prostatectomy involves an even [more] severe operative interference than castration, especially in young individuals."

Clear evidence of the importance of the prostate secretion to the body is afforded by the study of its loss as occurs in cases of spermatorrhea, a disease characterized by the involuntary emission of prostatic and other seminal secretions unaccompanied by any erotic sensation -- a condition closely allied to prostatitis. The loss of lecithin, cholesterin, phosphates, etc. thus occasioned exercises its most immediate and profound effect on the spinal cord and entire central nervous system. Spermatorrhea (literally "a flow of semen") was known to Hippocrates, who called the disease *tabes dorsalis*. He writes:

"*Tabes dorsalis* proceeds from the spinal cord. It is frequently met with among newly married people and libertines. There is no fever, the appetite is preserved, but the body falls away. If you interrogate the patients, they will tell you that they feel as if ants were crawling down the spine. In making water or going to stool, they pass much semen. If they have connection, the congress is fruitless. They lose semen in bed, whether they are troubled with lascivious dreams or not; they lose it on horseback or in walking. To epitomize: they find their breathing becomes difficult, they fall into a state of feebleness, and suffer from weight in the head and ringing in the ears. If in this condition they become affected with a strong fever, they die with cold extremities." For the cure of this condition, Hippocrates advised sex abstinence and avoidance of alcohol. Celsus advised in addition an avoidance of alcohol. Celsus advised in addition a special raw vegetable diet. Aretaeus advised continence and cold baths. Languius advises intestinal purification through proper diet as the basic factor in the cure of this condition.

Celsus believed that consumption may be caused by involuntary seminal losses. Satorius thought that spermatorrhea predisposes to calculus and loss of sight. Saint Marie, who was the first to emphasize the fact that the discharges of spermatorrhea consist of mucous secretions from the urethra and prostate gland, rather than of testicular fluid, observed that such discharges lead to affections of the spinal marrow. He writes:

"I have discovered that a great many cases of hypochondria, of slow nervous fevers, or consumption, were kept up by this kind of gonorrhea."

Wichman, in 1772, noticed that spermatorrhea was followed by consumption and hypochondria. He believed that masturbation and excessive sexual intercourse were the predisposing, and that constipation (leading to compression of the seminal vesicles while straining at stool), was an exciting cause. He writes: "All the patients observed by me were from twenty-five to forty years old. All were addicted to the pleasures of love, or to onanism.... When you see a man extremely thin, pale, stupid, enervated, complaining of great debility, especially in the thighs and loins, lazy in his actions, and with sunken eyes, you have reason suspect this cause."

Swediaur observed that involuntary discharge of prostatic secretion were followed by general debility, emaciation and even death. Cullerier attributed these losses to the irritation produced by hardened feces in the colon. The authority, Acton wrote:

"I am convinced that many of the most obstinate complaints which the medical man meets with arise from the loss of semen. The condition of ailment which we have

characterized as spermatorrhea, then, as we shall use the word, is a state of enervation produced, at least permanently, by the loss of semen."

Our modern knowledge of spermatorrhea dates back to Lallemand, who made the most careful study of this disease. He traces it to an inflammation, congestion and hypersecretion of the mucous membranes of the urethra, primarily initiated by frequent sexual orgasms and intensified by the irritation of toxic blood resulting from wrong diet and auto intoxication. Alcohol, coffee, tea and spices, by irritating the genital mucous membranes, he believes to contribute to this condition. The chief causes, he says, are "sexual excess and masturbation, which act principally by provoking inflammation or irritation of the ducts, and prolonged erections excited by erotic ideas or lascivious publications."

Professor Batholow of the Medical College of Ohio, in his book on spermatorrhea, considers masturbation and sexual excess as the chief causes. He then goes on to show that the frequently repeated sexual orgasm causes a condition of inflammation of the urethra, manifesting first as nocturnal emissions, and when more serious merging imperceptibly into true spermatorrhea, in which the act of emission occurs without erection, pleasure or particular sensation, the semen gradually losing its color, odor and spermatozoa gradually coming to resemble mucous or prostatic secretion, often being lost with the urine. Professor Bartholow believes that spermatorrhea may cause degeneration of the cells of the gray matter of the spinal cord, which indicates a relationship to tabes dorsalis or locomotor ataxia, which has been repeatedly observed by physicians in both ancient and modern times. This is understandable in view of the close similarity in chemical composition between the semen and the spinal cord, for which reason excessive losses of semen can deprive the myelin of spinal tissue of lecithin, which is so necessary for the nutrition of nerve cells. Deslandes, Tissot and others have described various spinal affections, including paralysis and poliomyelitis, caused by masturbation. On this subject, Prof. F.G. Lydston, professor of diseases of the genito-urinary organs at the Medical School of the University of Illinois, writes:

"As might be inferred from the fact that sexual excess and masturbation bear an important relation to locomotor ataxia, spermatorrhea is associated with that form of nervous disease more often than any other. The evil habit of masturbation, if continued, produces great irritation of the procreative organs -- especially of the seat of sexual sensibility in the prostatic urethra... Erotic dreams result, with losses of seminal secretion. This may merge into true spermatorrhea, the morbid condition finally becoming so pronounced that with little or no provocation, losses occur in the daytime."

"Spermatorrhea, in the majority of instances is the result of sexual excess or masturbation, and, moreover, the effects of the venereal organs being expended upon the nervous system, it is rational to infer that the disease when fully developed essentially is a neurosis."

Dr. Howe, professor of clinical surgery at Bellevue Hospital Medical School, believes that sclerosis of nerve fibers of the cerebellum may be caused by involuntary emissions

of semen by night or day. He also thinks that "diseases of the brain and cord are ushered in and accompanied by frequent ejaculations of seminal fluid. Many of the cases are accompanied by impotence, others develop satyriasis and priapism. He adds:

"In one case of partial cerebral sclerosis which involved a small portion of the cerebellum, the patient suffered from frequent emissions before any symptoms of cerebral trouble manifested themselves. Coincident with manifestations of the sclerosis, the pollutions were increased in frequency, and as the disease progressed, were of daily and nightly occurrence.

"Progressive locomotor ataxia was at one time supposed to arise from inordinate sexual congress and onanism.... A majority of patients suffering from locomotor ataxia have spermatorrhea of troublesome nature. In the later stages of the disease there is complete loss of virile power. In the cases which are preceded by spermatorrhea, the disease is of a more serious nature, and is more apt to run a rapid course and reach a fatal termination.

"Other diseases of the spinal cord, such as white softening, tumors and injuries, are all accompanied by some disarrangement of the genital functions. In some instances, they are characterized by frequent ejaculations and loss of virility; in others priapism and aspermatorrhea are present. In injuries which produce a certain amount of irritation and inflammation, the latter conditions are more likely to be present, while in anemic conditions, or chronic softening, seminal emissions and impotence are usual. Chronic or white softening of the spinal cord may arise as a result of masturbation and sexual excess."

Dr. Guy, in his "Diseases of the Urinary and Generative Systems," says that spermatorrhea is associated with pains in the back and with wasting away of the spinal marrow. Dr. Milton, in his "Spermatorrhea", speaking of the effects of this disease, says: "The more serious results are amaurotic(?) and epileptiform symptoms, epilepsy, phthisis, insanity, paralysis and death." Holmes, in his "System of Surgery," mentions a relationship between spermatorrhea and epileptiform symptoms. Dr. Russell wrote an article in the "Provincial Medical and Surgical Journal" on "The Connection Between Spermatorrhea and Epilepsy." Dr. Watson, writing on the relation between spermatorrhea and nervous and mental diseases, writes:

"I have not observed such results myself, with the exception of sanity, of which I have seen several instances; but, there seems no doubt about the facts themselves. Epilepsy seems clearly to have ensued in several cases of excessive masturbation. McDougall saw three instances of this; and Sir Thomas Watson speaks of it as a very frequent result.

"Dr. Durkee mentions epileptiform convulsions and idiocy as results of masturbation; and Dr. Lisle, medical inspector of one of the French lunatic asylums, states that spermatorrhea is a frequent cause of insanity, that this form of derangement is easily recognized, and that all treatment, directed solely against the brain is powerless here; whereas the affection is instantly and rapidly cured if the discharges be arrested, unless indeed the case has gone on to paralysis and dementia."

Formerly spermatorrhea and gonorrhea were identified as the same disease, and also gonorrhea and syphilis. Spermatorrhea appears to represent a catarrhal inflammation of the genital mucous membranes, accomplished by a mucous discharge. Ordinary nocturnal emissions constitute a primary manifestation of such a catarrhal inflammation, while true spermatorrhea represents a more advanced form, being the male homologue of leucorrhea in the female. When the inflammation of the genital mucosa advances from a catarrhal to a purulent stage, the discharge assumes a purulent character; and in place of whitish or colorless mucus, there occurs the characteristic yellowish purulent discharges of gonorrhea accompanied by the gonococcus. From the above considerations it is clear that the pathological symptoms of gonorrhea, especially those affecting the nervous system, must have a relation to the adverse effects on nervous tissue of the withdrawal of lecithin and other constituents of the seminal secretion produced by previous sexual orgasms and the urethral inflammation and involuntary discharges they produce. That gonorrhea is not entirely due to germ infection, but represents a more advanced state of inflammation of the genital mucosa than spermatorrhea, is indicated by cases of innocent gonorrhea resulting from sexual intercourse during menstruation by married couples both free from the disease, and as the result of masturbation in young girls. It is clear that the neurological symptoms of gonorrhea, like those of spermatorrhea, are produced, if not exaggerated, to a great extent by the loss of lecithin, through the seminal discharges which invariably precede this disease.

As the inflammation of the genital mucosa advances from a purulent (gonorrhreal, state of inflammation to a fibroid and atrophic one, we have the characteristic fibroid growths and cancers of the uterus in the female, while in the male, the cancer-like growths on the sexual organs characteristic of the beginnings of syphilis appear. That the demineralization and dealkalization of the blood through previous seminal discharges prepare the soil for such cancerous developments, there can be no doubt, while a resulting condition of acid intoxication can prepare the biochemical conditions of the organism for the skin pathologies of secondary syphilis, which bear a resemblance to those that accompany the seminal discharges resulting from the masturbation and involuntary emissions of puberty. As for the more serious symptoms of tertiary syphilis affecting the spinal cord and the brain, it is clear, from the above description of the effects of the lecithin withdrawals of spermatorrhea on these organs, that previous sexual excesses have an important relation to their production, as well as the mercury and arsenic compounds used in the initial stages of the disease, since before they were used in the treatment of syphilis, the specific tertiary form of the disease was comparatively unknown, and did not appear in its present virulence until after these powerful nerve poisons were introduced into medical practice. Prior to this time, syphilis was considered as a more serious form of gonorrhea and both conditions were identified under the name of "venereal disease."

From the foregoing, it is clear that there is an important internal physiological relation between the secretions of the sex glands and the central nervous system, that the loss of these secretions, voluntarily or involuntarily, exercises a detrimental effect on the nutrition and vitality of the nerves and brain, while, on the other hand, the conservation of these secretions has a vitalizing effect on the nervous system, a regenerating effect on the endocrine glands and a rejuvenating effect on the organism as a whole.

